Textile World

MAY, 1943

TECHNOLOGY DEPT
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MAY 20 1943

PLASTIC COATINGS

in the Post-War Era

PAGE 59

Official Emblem of the U. S. Army

WE SALUTE THE U. S. ARMY

. . . and the American manufacturers

whose skill and effort provide them

with the world's best equipment.

BUY U. S. WAR BONDS

COMMERCIAL FACTORS CORPORATION

Fred'k Vietor & Achelis, Inc. Established 1828 | Schefer, Schramm & Vogel Established 1838 | Peierls, Buhler & Co., Inc. Established 1893

TWO PARK AVENUE, NEW YORK

SEVENTY-SEVEN FRANKLIN STREET, BOSTON

TEXTILE WORLD. Vol. 93, No. 5. May, 1943. Published monthly by McGRAW-HILL PUBLISHING CO., INC., (Bragdon, Lord & Nagle Division). Publication Office, 99-129 North Broadway, Albany, N. Y. RETURN POSTAGE GUARANTEED. Editorial and Executive Offices, 330 West 42nd Street, New York, N. Y. Allow at least ten days for change of address.
Subscriptions: United States and Possessions, and Latin American Republics, $1.50 a year, $2.00 for two years, $3.00 for three years. Canada, $2.00 a year, $3.00 for two years, $4.00 for three years. Great Britain and British Possessions 12 shillings for one year, 27 shillings for three years. All other Countries $2.00 for one year, $4.50 for three years. Entered as second-class matter August 25, 1936, at Post Office, Albany, N. Y., under the act of March 3, 1879. Printed in U. S. A. Twenty-five cents per copy.

TECHNOLOGY DEPT.

[redacted] MANUFACTURING COMPANY
BALANCE SHEET
December 31, 1942

ASSETS

CURRENT ASSETS:		
Cash in banks and on hand		$ 80,402.66
Accounts receivable:		
Due from selling agents	$ 219,017.94	
Other current trade	9,702.02	
		228,719.96
Inventories (see comments):		
Manufactured goods	22,304.81	
Goods in process	67,858.52	
Raw Materials	204,776.06	
Store merchandise, waste, fuel and supplies	30,412.37	325,351.76
Total current assets		634,474.38
Real Estate, Plant and Equipment	$1,753,026.14	
Less reserve for depreciation	911,611.17	
		841,414.97
Depreciation Reserve Fund — Cash in bank		80,000.00
Post War Excess Profits Tax Credit		36,595.30
Deferred Charges and Other Assets		

CURRENT LIAB

This Mill Has Already Made a Start

We have received the following letter commenting on our recent advertising on Setting up Reserves in Cash to be used to buy the Better Looms you will need After the War

Draper Corporation
Hopedale Mass

Gentlemen:

I am very much interested in your current advertisements in which you advise mills to set aside a part of their earnings in a cash reserve.

I am sending you herewith a copy of our statement for the fiscal year, ended Dec. 31, 1942, in which we have done just what is suggested.

Instead of leaving the funds appropriated for depreciation in the quick assets, you will notice that we have segregated the amount and have deposited it in a separate bank account.

As a matter of fact, since the year end we have appropriated an additional $20,000 so that we now have a fund of $80,000 all applying to the year 1942. We further expect to use the post war excess profits tax credit for the rehabilitation of the plant.

Speaking of buying looms, how do you go about it at the present time?

The Answer is our Post-war Reservation List

Let's Talk It Over

DRAPER CORPORATION

Atlanta Georgia Hopedale Massachusetts Spartanburg S C

For Speed

IN WETTING OUT...

SURFAX W.O.

In tune with the times, Houghton's Surfax W. O. gives you *faster* wetting out for all types of textile processing. It's concentrated . . . you use less, yet get speedier wetting out and superior wetting-back properties, so important in sanforizing. Surfax W. O. has great efficiency at high or low temperatures. Use it as a softener, as a dye-bath leveler, as a penetrant, as an aid to the sanforizing process. The Houghton Man has the facts . . . ask him, or write—

E. F. HOUGHTON & CO.

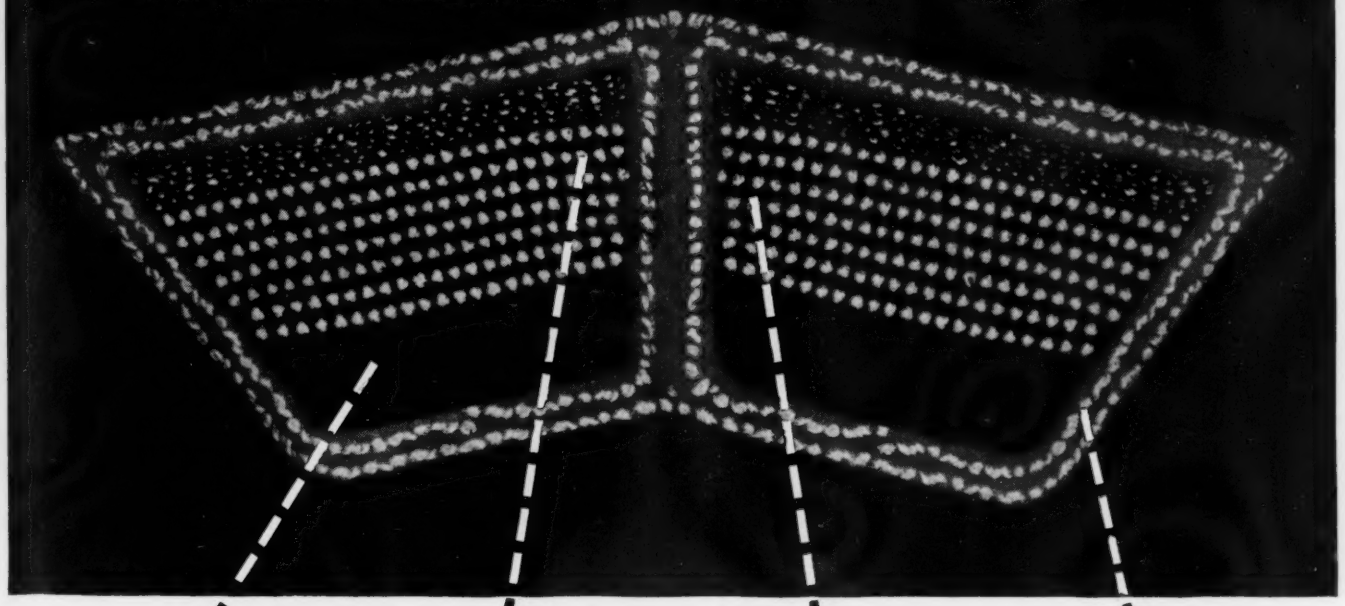
Charlotte · PHILADELPHIA · Chicago

Offices in all principal cities in The United States and Canada

Open Book on WARTIME CARE OF V-Belts

Texrope Super-7's new Design-Against-Wear points to ways you can make V-belts last longer — whatever brand you use — saving equipment vital to victory!

V-Day needs every V-Belt



DESIGN VS. HEAT . . . Texrope Super-7's revolutionary new shock-absorbing rubber cushion contributes to cool operation.

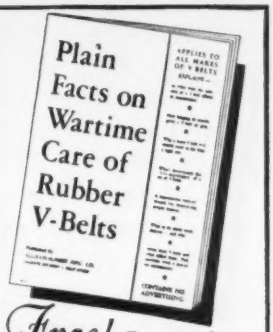
YOU can fight friction and heat by preventing misalignment. When present, it subjects V-belts to rubbing on their sides . . . builds up heat. So keep grooves in line — shafts parallel. And send in to Allis-Chalmers for "Plain Facts on Wartime Care of Rubber V-belts"; see p. 9.

DESIGN VS. STRETCH Texrope Super-7's 50% stronger cords produced by the new Flexon process combat stretching — plus the slip and heating that might result.

YOU can fight stretch — no matter what make of V-belts you are using — by promptly taking up any extra slack that may develop. Inspect drives regularly. See pp. 6 & 7 of Allis-Chalmers' new V-belt maintenance book for tips on proper tension.

DESIGN VS. BREAKS The 20% more cords built into the new Texrope Super-7 combat strains.

YOU can fight breaks by requiring that your V-belts never be pried into grooves — nor rolled from one groove to the next. Before installing or removing V-belts, the motor always should be moved forward. For added data, see POST MORTEMS, starting on p. 12 of "Plain Facts on Wartime Care of Rubber V-belts."



Free! Every engineer should have this important new handbook in his technical library. Applies to *all* makes —contains no advertising.

When you do need new V-belts, invest in the best . . . Texrope Super-7!

A 1542-A

ALLIS-CHALMERS

WE WORK FOR VICTORY — WE PLAN FOR PEACE

TEXROPE SUPER-7 V-BELTS

*Trade mark registered U. S. Patent Office. Texrope Super-7 V-Belts are the result of the cooperative research and design genius of two great companies — Allis-Chalmers and B. F. Goodrich — and are sold exclusively by Allis-Chalmers. Available in all sizes..... ½ h.p. to 2,000 h.p.

THE TARIFF

Comments by Henry G. Lord

The Presidential campaigns of the 80's and 90's, indeed, those up to the First World War, centered largely around the tariff; whether there should be high protection for American manufactured products against foreign imports or low duties to promote interchange of commerce.

With few exceptions, textile mill men, especially wool manufacturers, all were for the high duties; so were the wool growers and the steel manufacturers.

The Cleveland-Blaine campaign of 1884 was the first big political fight that I can remember distinctly. The tariff was an important issue of that battle, but there also was a lot of dirty mud-slinging flavored with a good share of personal scandal.

Not having radios or movies in those days, we welcomed the political campaigns for excitement and free shows. Countless rallies were held at which the electorate had the opportunity not only of seeing and hearing the candidates, but also of quizzing them. Fiery speech-making by local and national spellbinders provided good entertainment and the torchlight processions afforded opportunity for the younger generation to give vent to their feelings.

Controversy raged not only in public meeting places, but in homes and offices. I was too young to vote, but the campaign was so bitterly fought that like everybody else, young and old, I lined up as a strong partisan. Many of the younger men of Republican background broke away from the old tradition and became "mugwumps," which was the name derisively bestowed on those who went over to the Cleveland camp. I became a "mugwump."

But when Cleveland afterwards attacked the protective tariff, I ceased to be a "mugwump."

I well remember an incident of that period. It was several years after the Cleveland-Blaine campaign. I had been in Maine on a fishing trip and was returning on the night train from Bangor. As I was sitting alone in the smoking compartment while the porter made up my berth, a handsome old gentleman, with snowy white hair and beard, entered, sat down and lighted a cigar. To my amazement I recognized James B. Blaine, the "White-Plumed Knight" of the Republican Party.

After a little time, during which I sat in awed silence, he turned to me and started a conversation. He immediately put me at ease by his kindly manner. We chatted for over an hour about fishing and the woods, until we reached Augusta which was his home.

When he got up to go, I said to him, "Mr. Blaine, I would like you to know that I was once a 'mugwump,' but now I am a Republican and I hope I will have a chance to vote for you the next time." He laughed heartily.

But I didn't have the chance; he refused to be a candidate for the Republican nomination in 1888. Harrison was nominated and was elected. Blaine became Secretary of State and inaugurated the friendly policy with Latin America which resulted in the Pan-American Conference.

The McKinley Tariff Bill was passed by the Congress and the textile industry prospered again.

In recent years the tariff has not been the outstanding feature of our political campaigns that it used to be, but I look forward with some anxiety to the tariff situation after the war. It surely will be a feature of the postwar adjustments.

HENRY G. LORD, *Vice-President of McGraw-Hill Publishing Co. and Founder of Textile World*

Beats the Heat ON CALENDER BEARINGS

SUN LUBRICANT

"overcomes problem of hot bearings . . . cuts cost in half"

The heat was on! Army and navy contracts kept the machinery in this large textile mill humming 'round the clock. On their calenders, this heavy schedule resulted in a serious lubrication problem. Bearing temperatures ran up to 380° F. . . . and no lubricant they tried would do a satisfactory job.

At the suggestion of a Sun Doctor of Industry — a textile lubrication engineer — they tried Sun High Melting Point Grease applied in a special way. It worked! The old troubles of grease running off and carbonizing were eliminated.

A lubrication survey by Sun Engineers covering the equipment in all of the mills of this company has now been generally adopted . . . and Sun Lubricants are doing an outstanding job.

Proof again that here are lubricants and lubrication service that can help keep victory wheels turning in your mill . . . longer . . . faster. Why not have a Sun Doctor of Industry study your lubrication problems . . . and make suggestions to step up production and get maximum service out of every piece of equipment? Write today to Sun Oil Company, Philadelphia.

SUNOCO

SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA

SPINNING A WEB FOR VICTORY!

When you speak of the textile industry's part in the war, people nod sagely: "Oh, yes—uniforms!" But the Army Quartermaster General—and the Navy, too, could tell a different story.

Mills that made carpets and upholstery now weave army blankets and cotton duck. Silk and rayon dress goods has been converted to parachutes. Curtains have switched to mosquito netting and sand bar fabrics. What used to emerge as ribbon, labels and other narrow fabrics is today webbing for machine gun belts and parachute harness.

Silk makes not only parachutes, but bags for powder. Rayon has gone to high-strength yarns for cords in tires for heavy bombers. Cotton is used for tents, sandbags and many other special purposes. Wool emerges as wristlets anklets, caps, mufflers for soldiers, sailors and marines. Textile finishers have converted to military finishes which make fabrics proof against water, flame, mildew and gas.

America's textile industry . . . 6,000 textile mills . . . are in this war to the hilt. It is an industry dotted with Army-Navy "E" flags for exceptional production. These awards are evidence that you can't fight a war without textiles . . . that they are truly "spinning a web for victory."

COLUMBIA Essential Industrial CHEMICALS

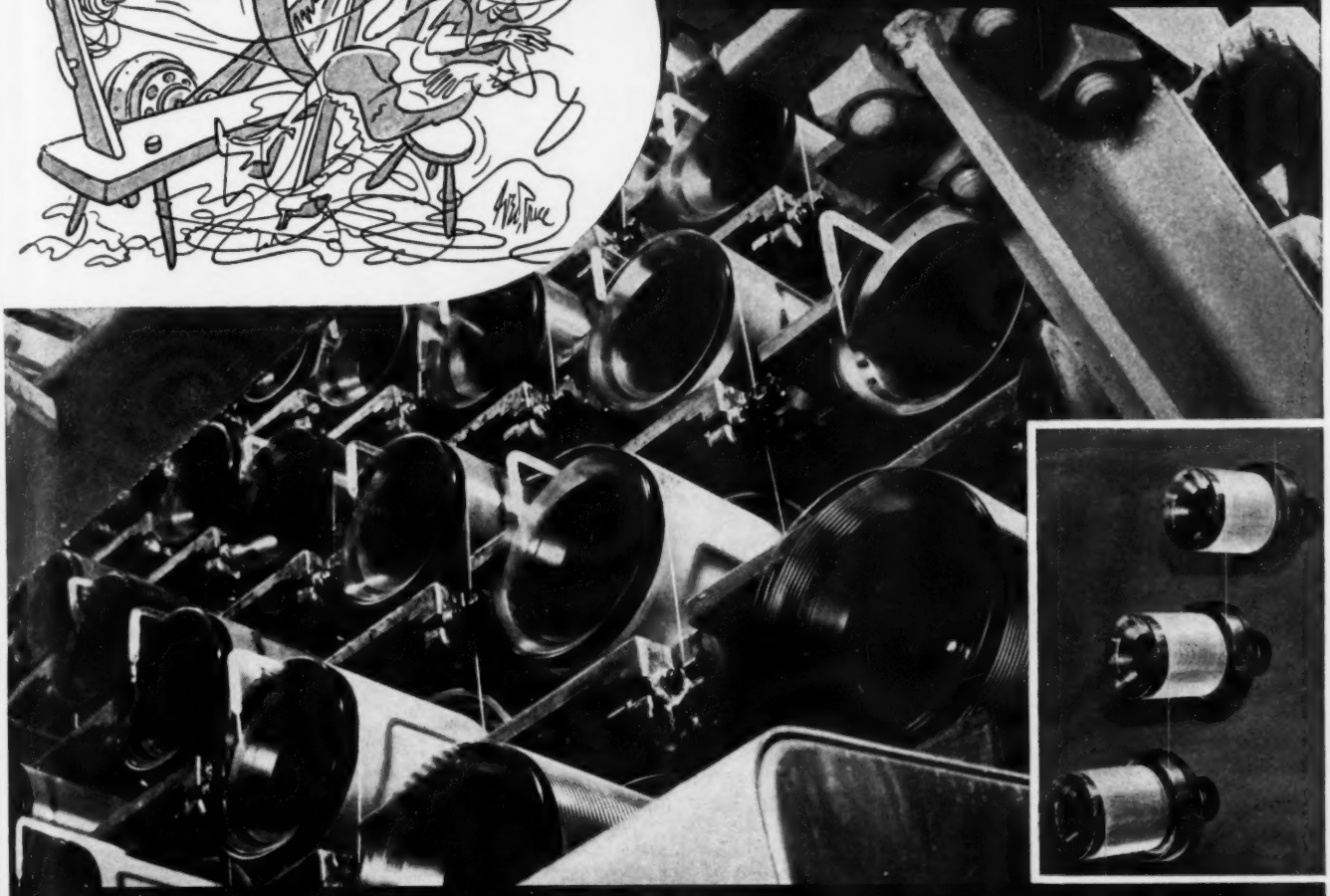
SODA ASH · CAUSTIC SODA · LIQUID CHLORINE · SODIUM BICARBONATE · SILENE* · CALCIUM CHLORIDE
SODA BRIQUETTES · MODIFIED SODAS · CAUSTIC ASH · PHOSFLAKE · CALCENE** · CALCIUM HYPOCHLORITE

*Hydrated Calcium Silicate **Precipitated Calcium Carbonate

PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
GRANT BUILDING · PITTSBURGH, PA.

CHICAGO · BOSTON · ST. LOUIS · PITTSBURGH · NEW YORK · CINCINNATI · CLEVELAND · PHILADELPHIA · MINNEAPOLIS · CHARLOTTE

RAYON . .
BY THE MILE



. . a continuous process aided by New Departure Ball Bearings

● The lowly silk worm has become old-fashioned indeed. Now, from liquid Rayon, finished thread is manufactured and wound in one continuous process—ready for the textile mill.

But the 100,000 reels and spindles of this great plant could not operate continuously without the friction-reducing, wear-avoiding qualities of the New Departure self-enclosed and lubricated ball bearings at more than 300,000 points. In fact, they make such a project commercially possible—simplify design, accurately locate rotating parts, eliminate periodic oiling and definitely reduce costs.

New Departure Forged Steel Ball Bearings are literally the *life* of any machine. Nothing rolls like a ball.

3151

This self-enclosed ball bearing is only one of numerous "new departures," the result of New Departure's well known creative engineering. Get acquainted with our special purpose textile bearings for your post-war machines. . . . New Departure Division of General Motors Corp., Bristol, Connecticut.

NEW DEPARTURE BALL BEARINGS

are now busy helping to win the war

AN UNBEATABLE TRIO

for the Maintenance of Waxed Floors!

—Solarbrite Scrub Soap, Fino-Gloss Floor Wax, and Sanax Wax Cleaner. They have what it takes to help you save on the three *m's*—materials, maintenance, man-power—while serving the important purposes of making floors last and keeping them cleaner and safer.

Solarbrite. A neutral liquid soap made of pure vegetable oils. Extremely heavy in density . . . goes farther. Quickly removes stains, grease, et cetera. It's the perfect cleaner for linoleum, marble, terrazzo, and sealed wood surfaces.*

Fino-Gloss. A liquid floor wax containing genuine Carnauba Wax, the wear-resisting agency. Requires no polishing or buffing, and is guaranteed safe for all floors. Comes in several types, including Concentrated and Special Non-Skid and Waterproof Types. *Concentrated Fino-Gloss* saves vital containers as well as shipping weight and space.*

Sanax. A slow-running mixture that quickly, safely, and economically removes dirt, oil, grease. Leaves a semi-wax non-skid finish. Fine for cleaning linoleum, tile, terrazzo, wood, marble, and composition floors.*

For consultation or literature on any *Finnell* product, phone or write nearest *Finnell* branch or Finnell System, Inc., 1905 East Street, Elkhart, Indiana.

*** Sold in 1, 5, 30, and 55-gallon containers.**

OTHER *Finnell* PRODUCTS

- Finnell-Kote — *A Solid Wax*
- Finnell Liquid Kote
- Finnell Liquid Wax
- Finnell Paste Wax
- Finnell Cream Kote
- Gloss Seal — *Several Types*
- Traffic Seal
- Finnell Terrazzo-Fil
- Finnell Fulfil — *An Oil Filler, Sealer*
- Finnell Gym-Fil
- Finnell Rubber Cleaner
- Selar Soap Powder
- Finola Scouring Powder
- Century Scouring Powder
- Setol — *All-Purpose Cleaner*
- Asesco Solvent Cleanser
- Han-Kleen — *Heavy Duty Hand Soap*
- Han-San — *Liquid Hand Soap*
- Rug Shampoo
- Crystal Cleanser — *For Dishwashing*
- Killum — *An Insecticide*
- Floor Scrubbers
- Accessories

FINNELL SYSTEM, INC.

Pioneers and Specialists in

FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

FLUORESCENT LIGHTING
for War Plants

ANOTHER MARTIN-GIBSON DETROIT PRODUCT

Available in two 40-watt, three 40-watt and two 100-watt sizes. Features high reflection factor (89 to 91%) reduced weight; streamlined, continuous wireway.

Sold exclusively through wholesalers
On-the-Spot Information and Service

Martin-Gibson Fluorescent Luminaires are a vital part of the nation's war production program. They are helping to speed production in some of the nation's outstanding war production plants . . . and the *line* includes everything needed to do a good lighting job . . . in any plant, anywhere.

Produced in the world's mass production center, Martin-Gibson Fluorescent fixtures exemplify in quality, efficiency and economy all the tangible advantages of mass production skill.

Typical M-G Luminaire shown above also available in continuous runs. Our catalog shows this and in addition, the complete M-G line that will be available *after the duration.* Send for it.

Shortly we will have ready for you *new Luminaires* using a minimum of critical materials. These will be available to all war plants requiring improved production lighting. Write now and let us put you on our mailing list to receive early information about these new products.

We sell through wholesalers exclusively!

When we answer your request for catalog or other information, we will include address of our nearest wholesale representative.

To Wholesalers: *If Martin-Gibson Luminaires are not already wholesaled in your community, write us. You will like our broad, fair policies.*

Will soon be ready for you

New line of Brilliantly Designed Luminaires for War Plants

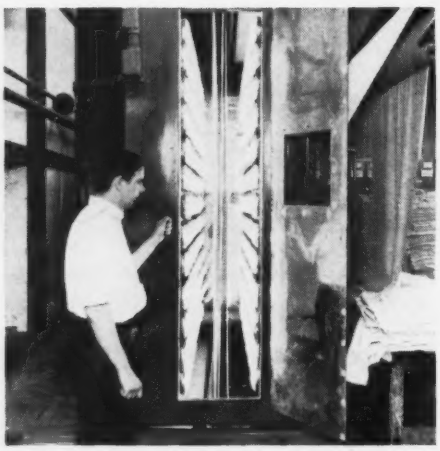
Employ a minimum of critical materials. Sleek and neat in appearance — efficient in operation. Feature practical advantages that will please buyers — and sellers. Be sure and write for advance information.

New catalog sent on request

MARTIN-GIBSON CO.
999 HARPER AVENUE • DETROIT, MICHIGAN

AN UNQUALIFIED SUCCESS . . . THE TEXTILE INDUSTRY'S FIRST INFRA-RED BAKER . . . .

Nearly a year ago we installed in a well known woolen mill the textile industry's first Infra-Red Unit for carbonizing vegetable matter in woolen cloth. In continuous operation since that time, this machine has proved to be an unqualified success.



ADVANTAGES

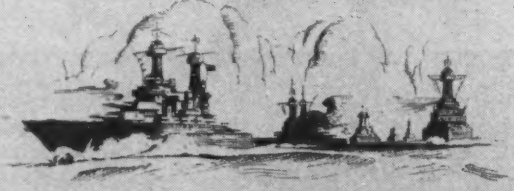
1. 50 to 60% saving in initial investment, as compared with steam heated baker of equal capacity.
2. Substantial savings in over all operating costs.
3. 75% saving in floor space.
4. No spoilage of cloth when machine stops; heat is turned off automatically and the unit "stores" very little heat.
5. Instant flexibility. Lamp banks are so wired that carbonizing can be varied to suit cloth.
6. Efficient intermittent operation. Warm up period is eliminated, because heat is projected on cloth direct.
7. No "yellowing" of cloth.
8. More uniform dyeing especially on light shades.

This unit may be used for curing Zelan treated or Rhonite treated cloths, as well as for carbonizing.

FURTHER DETAILS ON REQUEST

RIGGS & LOMBARD, Inc.
FOOT OF SUFFOLK ST.
LOWELL, MASS.

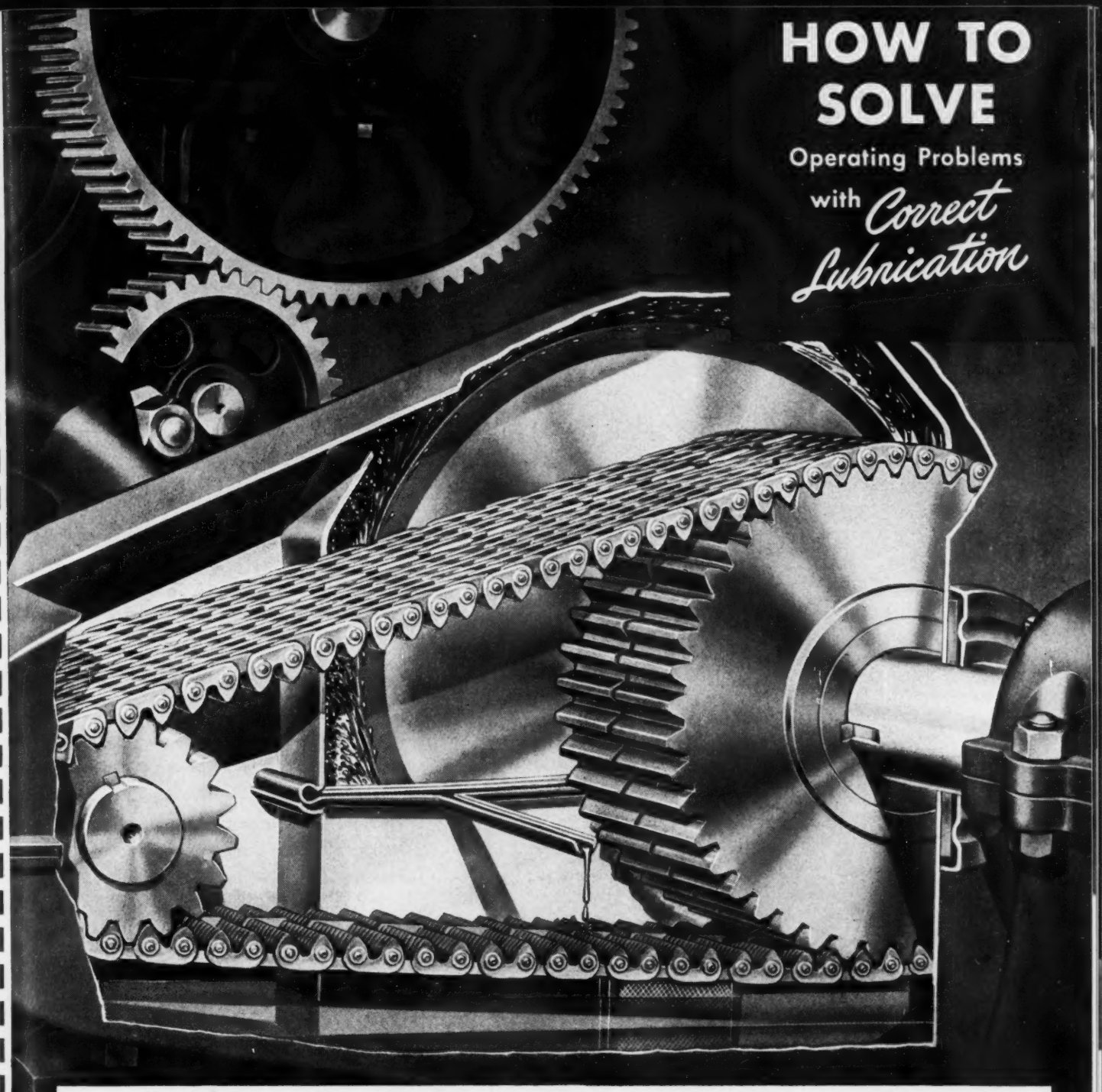
The Fleet Line



OF FINISHING EQUIPMENT

AGENTS: Paul A. Merriam, 11 Berwick Lane, Edgewood, R. I., Harold C. Osler, 6312 Sherwood Road, Philadelphia, Pa.

ONE OF A SERIES OF MONTGOMERY ROSS-FLETCHER ENGINEERED PRODUCTS



HOW TO SOLVE

Operating Problems with *Correct Lubrication*

Keep this "Chain Gang" Tough!

MODERN CHAIN DRIVES are playing an important part in maintaining wartime production. They have been designed to take heavy loads at high speeds. They'll do their job week after week if given proper service and lubrication.

First, keep your chain drive in proper mechanical condition and correct adjustment, then the next step is... **USE GARGOYLE VACUOLINE OIL** for the type of lubrication shown above. This oil will penetrate the close clearances between the pins and bushings. It will provide a dependable, protective oil film... assure minimum maintenance...maximum oil life. There's the type lubrication you're looking for.

GARGOYLE Lubricants

SOCONY-VACUUM OIL COMPANY, INC. — Standard Oil of N. Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. White Eagle Div. • Wadhams Div. • Magnolia Petroleum Company • General Petroleum Corporation of California

CALL IN SOCONY-VACUUM

and this is another wartime job for — TUFFER CARD CLOTHING

Along with her brothers-in-arms she must have adequate and safe work clothing. This is just part of the production job and just part of the reason why card room efficiency should be kept at its peak.

During this emergency we cannot urge you too strongly to make regular and more frequent inspections of your card clothing. If it shows undue wear consult your Tuffer Card Clothing engineer. He can help you keep it rolling. If it's worn beyond repair replace with Tufferized Card Clothing. This exclusive patented process is your guarantee of accuracy and uniformity hitherto unknown in the manufacture of card clothing.

HOWARD BROS. MFG. CO.

WORCESTER, MASSACHUSETTS

Southern Plants	Atlanta, Ga., Gastonia, N. C.
Branch Offices	Philadelphia, Pa., Dallas, Texas
Canadian Agents	Colwool Accessories, Ltd., Toronto 2

TUFFER PRODUCTS

Card Clothing for Woolen, Worsted, Cotton, Asbestos and Silk Cards • Napper Clothing, Brush Clothing, Strickles, Emery Fillets. Top Flats Recovered and extra sets loaned at all plants. Lickerins and Garnet Cylinders from 4 to 30 inches and Metallic Card Breasts Rewired at Southern Plant • Midgley Patented, and Howard's Special Hand Stripping Cards • Inserted Eye & Regular Wire Heddles

burned out motor

back on the job in 22 hours

BURNED-OUT MOTOR OF SPECIAL DESIGN RECEIVED 5:00 P. M. AT WESTINGHOUSE DISTRICT MANUFACTURING AND REPAIR PLANT RE-PLACEMENT IMPOSSIBLE TO OBTAIN. MOTOR STRIPPED, REWOUND. STATOR DIPPED, BAKED, ASSEMBLED AND TESTED DELIVERED TO USER FOLLOWING DAY, 3:00 P. M — 22 HOURS AFTER BREAKDOWN.

Westinghouse

DISTRICT MANUFACTURING AND REPAIR

J-90468-A

***WHEN* ELECTRICAL EQUIPMENT NEEDS MAINTENANCE OR REPAIR . . . PHONE THE NEAREST OFFICE OF WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY FOR**

EMERGENCY SERVICE

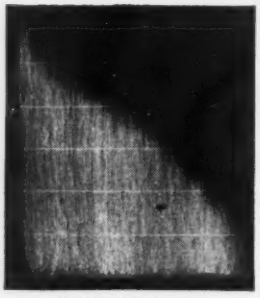
33 M & R PLANTS . . . ONE NEAR YOU!

RAYON REPORTS

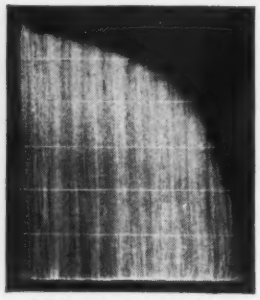
Presented by American Viscose Corporation, New York, N. Y. MAY, 1943

VARIED STAPLE LENGTH A NEW DEVELOPMENT

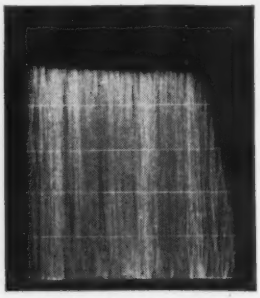
"FIBRO"-WOOL COMPARATIVE STAPLE DIAGRAMS



60/62's Oil Combed Worsted Top



5.5 Denier 3½ ins.-6 ins. Bright "Fibro" Top



5.5 Denier 5 ins. Dull "Fibro" Top

Nitro, W. Va.—From this well-known munition center comes news of interest to the worsted trade. Recently developed under the direction of the Sales Development Department of the American Viscose Corporation is the varied staple length. Interviewed as to the merits of this new development, leading spinners state that the controlled production of varied staple length insures a blend of lengths that complements those found in wool and results in more evenly spun yarn. As with regular rayon staple, which is made within close length tolerances, there is no problem of overlength fibers to be broken in the drawing, and of underlength ones to add to the noilage. It is reported that production of varied staple length is available in several varieties, suitable for both Bradford and French processes. To further acquaint the trade with varied length, sample poundage in top form is being offered gratis.

RAYON PRODUCERS ASKED TO EXPAND OUTPUT

Frank L. Walton, Director of the Textile Clothing and Leather Branch of the War Production Board, has requested every rayon producer in the country to increase output of rayon fiber and yarn to the maximum levels attainable with present manpower and production facilities. The director's appeal was made in line with the general policy of the textile division to encourage an all-out effort to step-up production of all textile fibers, yarns, and products wherever possible as the best assurance of a completely adequate supply of textile materials for military and essential civilian needs.

"Rayon plays a very important part in the war program," Mr. Walton declared. "It is absolutely essential for many military purposes. There are some military uses for rayon today which cannot very well be taken care of by other fibers."

"TUFTON" MAKES HEADWAY IN FLOOR COVERINGS

From the rug front. For many months, the ancient art of rug and carpet weaving has been undergoing a revolution. "Tufton," a tough and durable fiber, designed for the tuft of rugs, is partially responsible. Developed by the American Viscose Corporation in answer to the floor covering trade's demand for a new type of rayon staple fiber, "Tufton" is resulting in greater customer satisfaction. Resilience, flexibility, tenacity, each as perfectly balanced as possible, produced this result. Better soil-resistant properties have been made possible by giving the fiber special qualities of smoothness.

Already seven leading rug and carpet manufacturers are reported as having adopted "Tufton."

OWI STRESSES CONSERVATION

The Office of War Information, indorsing "Clothes Conservation Week" recently, said this: "Rayon will probably be scarce in the future. The replacement of clothing therefore becomes a gigantic problem. Never has there been such a need for the civilian to keep what he has already in good repair, to get from it as much wear as possible, and to mend and patch with a patriotic fervor."

And all we can add to that is this: Never before has there been such a need for the manufacturer to turn out quality merchandise that will give long wear. Our 4-PLY SERVICE can often help you to make a good product even better. Now's the time to put that service to use.

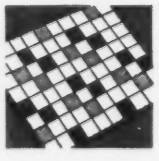
*T. M. Reg. U. S. Pat. Off.

Copr. 1943—American Viscose Corp.

4-PLY SERVICE

1 PRODUCT RESEARCH. In our laboratories and pilot plants scientists are constantly at work, perfecting types of rayon yarn and fiber now available, creating new types to meet specific problems.

2 FABRIC DEVELOPMENT. A whole department is devoted to this phase of the industry. It can help you design new and successful fabrics which you can produce efficiently on your existing machinery.



3 TEXTILE UNIT. Have a mill problem? Our Textile Unit, equipped for virtually every phase of textile production, can help solve problems in weaving or knitting, dyeing, and finishing.

4 "CROWN" TESTED. The CROWN* Tested Plan helps sell serviceable rayon fabrics, gives scientific performance facts, helps you to establish and maintain the quality of new fabrics containing CROWN Rayon.

AMERICAN VISCOSE CORPORATION

Producers of CROWN* *Rayon Yarns and Staple Fibers*

Sales Offices: 350 Fifth Ave., New York City; Providence, R. I.; Charlotte, N. C.; Philadelphia, Pa.

Plants at: Marcus Hook, Pa.; Roanoke, Va.; Lewistown, Pa.; Nitro, W. Va.; Parkersburg, W. Va.; Meadville, Pa.; Front Royal, Va.

SHOULD YOU BE USING ACCOTEX APRONS?

Read why these long draft aprons spin better yarn at lower cost . . .

SIX OPERATING ADVANTAGES tell how you can save time, trouble, and money by switching to Armstrong's Accotex (synthetic rubber) Aprons for spinning and roving frames—

1. ***Seamless:*** Accotex Aprons have no seams to break open and shorten service life.

2. ***Nonstretching:*** Accotex Aprons are reinforced with a sturdy interliner . . . eliminating loss of efficiency due to stretching during operation.

3. ***Uniform:*** All Accotex Aprons have identical composition, and dimensions of every size are accurate. Barring unusual mill accidents, each Apron will give the same good service.

4. ***Clean-Running:*** Accotex Aprons do not crack or scuff in operation. They assure cleaner-running work and less waste.

5. ***Reduce Lapping:*** Accotex Aprons are not affected by changing temperature or humidity. Hence they perform with a minimum of lapping.

6. ***Long Life:*** Hundreds of thousands of Accotex Aprons have been in continual service for more than two years, and they show very little sign of wear.

Your Armstrong representative will be glad to give you details and samples of Accotex Aprons. Or write direct to Armstrong Cork Company, Textile Products Section, 8305 Arch Street, Lancaster, Pennsylvania.

ARMSTRONG'S ACCOTEX APRONS

CORK COTS · ACCOTEX COTS

PAWTUCKET RINGS *Vitritex* FINISH

Many factors contribute to the spinning of good yarn . . . and the ring is one of them. When old and worn it affects the performance and life of the traveler—and thus indirectly affects the quality of the yarn by causing variations in the size and tension of the balloon.

The efficiency of a ring depends upon the permanence of its finish. The finish on a Pawtucket Ring is an exclusive development. It is glass-smooth, hard as granite, and highly resistant to wear. The texture of this finish is so fine grained that it is nearly non-porous. Thus it is almost impervious to the tarnishing effects of moisture in the highly humidified spinning room.

Pawtucket Rings are a definite contribution to good spinning, steady production and better traveler performance. We will gladly furnish samples on which you can make your own tests.

GIVE YOUR TRAVELERS
"A TURN FOR THE BETTER"

Pawtucket SPINNING RING COMPANY, CENTRAL FALLS, RHODE ISLAND
(Subsidiary of Saco-Lowell Shops)

The Franklin Process "SHUTTLE" SYSTEM

THE ANSWER TO ANY PACKAGE DYEING PROBLEM . . . While all of our four plants offer a general yarn dyeing service, each plant serves predominantly some particular branch of the textile industry, according to its geographical location.

Yet it makes no difference what type of fabric you make or which Franklin Process plant fills your order; you'll get yarn, dyeing and winding that is equally suitable for your purpose. That's because we "shuttle" information back and forth. Thus the experience of any one plant is multiplied by four.

We also "shuttle" orders when delivery requirements demand it, thus saving you unnecessary delay.

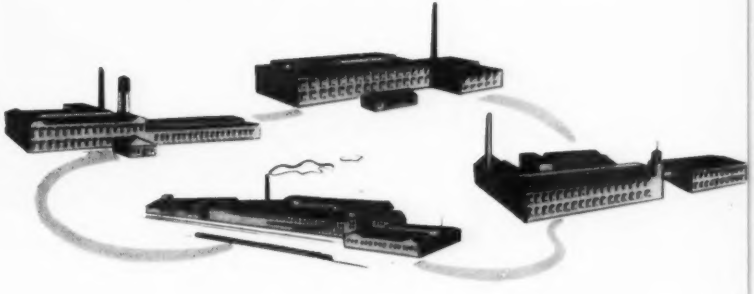
It's GOOD INSURANCE to use our Service.

Shirtings and dress goods. Serving this field is one of the specialties of our Providence plant.

Franklin Process

LARGEST PACKAGE DYERS IN THE WORLD

YARN DYERS AND COLORED YARNS – PROVIDENCE, PHILADELPHIA, GREENVILLE, CHATTANOOGA. NEW YORK REP., 40 Worth St.; CHICAGO REP., 100 W. Monroe St.



Just as the experienced runner saves something for the homestretch, so do many buyers of card clothing insure themselves against emergencies by doing business with Ashworth, for this company has . . .

3 FACTORIES which assure an uninterrupted suply of card clothing. If one factory is temporarily disabled, another factory can "pinch hit" for it.

6 REPAIR SHOPS which facilitate convenient and prompt repairs and which again insure you against emergencies.

7 DISTRIBUTING POINTS which speed up deliveries of those items we have in stock and facilitate personal contacts when the mill has card clothing problems.

These buyers also know that Ashworth Products are dependable, for we are "Pioneers in Card Clothing".

★ ★ ★

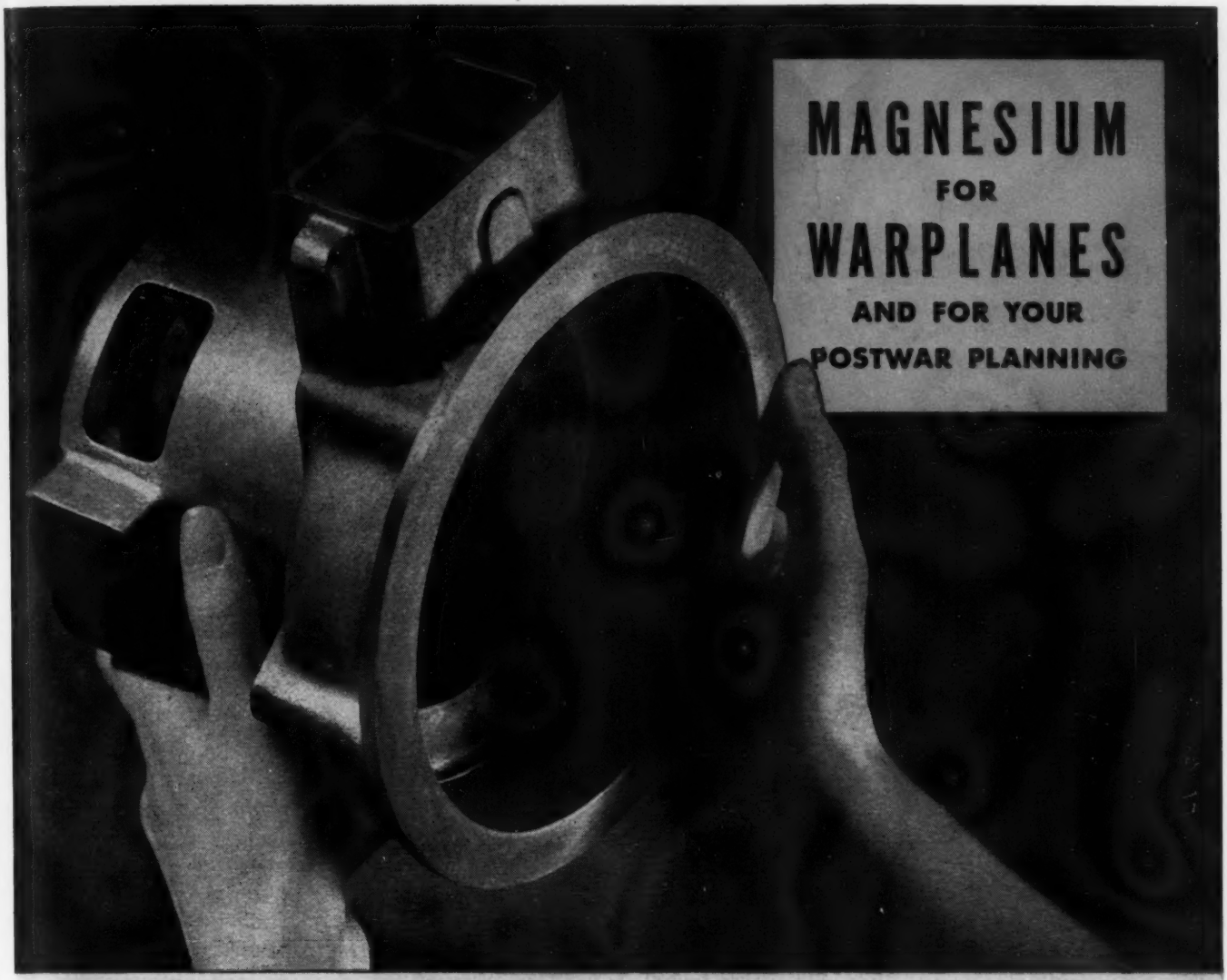
ASHWORTH BROTHERS, INC.
***Woolen Div.*, AMERICAN CARD CLOTHING CO.**

Fall River*†‡ Worcester*‡ Philadelphia*†‡ Charlotte†‡ Greenville†‡ Atlanta†‡ Dallas†‡ (Textile Supply Co.)

**Factory †Repair Shop ‡Distributing Point*

ASHWORTH
PIONEERS IN
CARD CLOTHING

PRODUCTS AND SERVICES: Card Clothing for Cotton, Wool, Worsted, Silk and Asbestos Cards and for all Types of Napping Machinery • Brusher Clothing and Card Clothing for Special Purposes • Lickerin Wire and Garnet Wire • Sole Distributors for Platt's Metallic Wire • Lickerins and Top Flats Reclothed.



This Mazlo Magnesium permanent-mold casting is an airplane starter-motor housing, one of many thousands made by American Magnesium Corporation. Magnesium contributes the lightness and high strength so necessary in aircraft; "Know-how" contributes the soundness and accuracy of detail that simplify and speed manufacturing.

Where parts are required in sufficient quantities, permanent-mold castings offer these advantages over sand castings: Surfaces are smoother and grain structures finer. Dimensional tolerances are closer, so castings can be lighter and need less machining. Costs of finished parts are usually less.

After the war, there will be a wealth of capacity to take care of your permanent-mold casting requirements—many times that of prewar industry.

Magnesium alloys have casting characteristics peculiar to themselves, in addition to low specific gravity. This means that the methods of gating, chilling and coring, and how the metal is handled, all affect the quality of castings. That's where our experience can serve you best.

Twenty years of working with magnesium alloys have taught us *how*. American Magnesium engineers and plant men offer you that guidance. Sales Agent for Mazlo Magnesium Products: Aluminum Company of America, 1705 Gulf Building, Pittsburgh, Pa.

MAGNESIUM MAZLO PRODUCTS

AMERICAN MAGNESIUM
CORPORATION
SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

"Baa! Baa! Black Sheep

. . . have you any wool?"

MORE than just a nursery rhyme, that simple question contains the germ of the entire problem of the "natural" fibers —wool, silk, flax, cotton. All are subject to Mother Nature's whims, and wishes. Rayon, a man-made, man-controlled fiber, is truly free. Only man's ingenuity limits rayon production in either quantity or quality. As one of the largest rayon producers, Industrial Rayon has seen this fundamental distinction from the very beginning. It has chosen to concentrate its technical skill on the quality side. Results:

"CONTINUOUS PROCESS" Rayon Yarn—a new method exclusive with Industrial, that produces yarn, from spinning to twisting, untouched by human hands. The resultant yarn is more uniform than anything known before and is virtually free of knots and broken filaments.

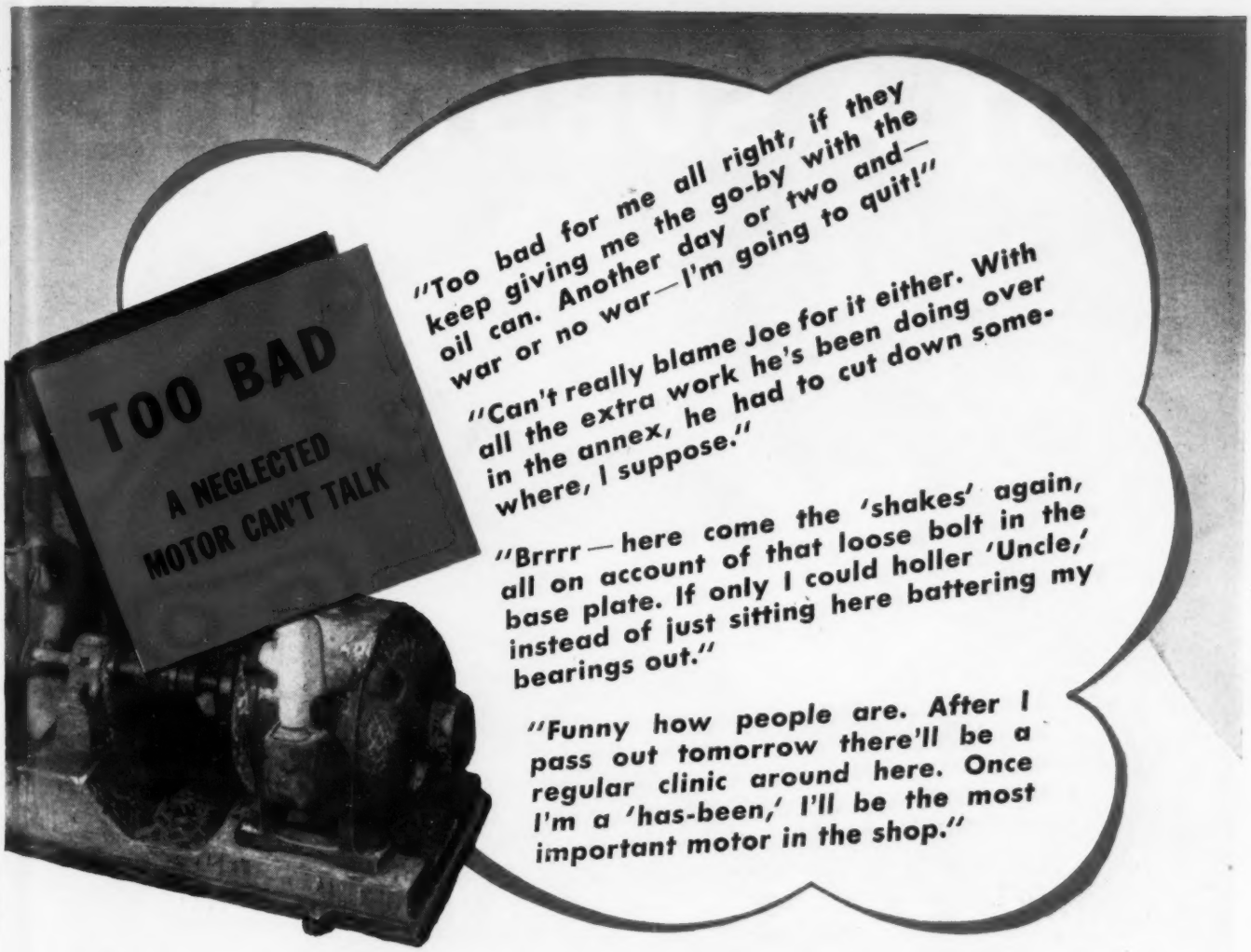
"SPUN-LO" Knitted Fabric—a new standard for underwear cloth—uniform, as only a cloth can be that is produced from raw material to finished product, under one roof—dainty, durable, lovely to handle, washable as a handkerchief.

And rayon is still a comparative babe among textiles. New and greater wonders are still to come, once war demands are at an end and all man's skill turns once more to creating for a peacetime world.

Industrial

RAYON CORPORATION

Cleveland, Ohio
New York Office, 500 Fifth Avenue

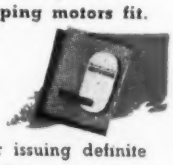

TOO BAD
A NEGLECTED MOTOR CAN'T TALK
"Too bad for me all right, if they keep giving me the go-by with the oil can. Another day or two and—war or no war—I'm going to quit!"
"Can't really blame Joe for it either. With all the extra work he's been doing over in the annex, he had to cut down somewhere, I suppose."
"Brrrr—here come the 'shakes' again, all on account of that loose bolt in the base plate. If only I could holler 'Uncle,' instead of just sitting here battering my bearings out."
"Funny how people are. After I pass out tomorrow there'll be a regular clinic around here. Once I'm a 'has-been,' I'll be the most important motor in the shop."

Preventive Care of Motors

. . . IS A MANAGEMENT PROBLEM

HERE'S HOW G.E. CAN HELP YOU SOLVE IT

A regular schedule for oiling, cleaning, and inspection of every motor is half the battle in keeping motors fit.



The G-E booklet "How to Care for Motors" tells what to do and when to do it. You can use it as a basis for issuing definite instructions, and for analyzing the hours of work involved so that your maintenance crews can be adequately staffed. Ask for GEA-2856A.

To get the most out of motors, and to meet new WPB requirements, the required horsepower for every job must be accurately known. On metal-cutting operations, the new G-E MOTORULE is just what you need to determine your requirements. Simple to use, it saves time and saves motor horsepower. Ask for GEL-763.

Free G-E Motor Record Cards (GES-1526A) make it easy to keep a convenient record of the specifications and service history of every motor in your plant.

General Electric, Sec. B 750-208, Schenectady, N. Y.

Yes, please send me:

- ☐ "How to Care for Motors" (GEA-2856A)
- ☐ G-E MOTORULE (GEL-763)
- ☐ A supply of ..... Motor Record Cards (GES-1526A)

Name .....

Company .....

Address .....

City ..... State .....

BUILDER OF TRI-CLAD MOTORS

GENERAL ELECTRIC

NOT A SUBSTITUTE

but a new member of the Textile Family

★ARALAC

the man-made protein fibre stands on its own merits

ARALAC makes a definite and individual contribution to textile manufacture. It combines characteristics found in no other fibre. It possesses many of the so desirable attributes of wool. Blended with rayon it provides that preferred "worsted touch". That is why ARALAC, when blended with these fibres, creates completely new textiles—rich and beautiful—thoroughly practical. For details write to

★T. M. Reg. U. S. Pat. Off.

ARALAC, INC.
230 Park Avenue, New York City

ARALAC, INC., a division of NATIONAL DAIRY PRODUCTS CORPORATION represents but one of the many contributions this nation-wide organization is making toward the more efficient utilization of America's agricultural resources.

GRATON & KNIGHT DISTRIBUTORS

ALABAMA
Birmingham — The Young & Vann Supply Company
Mobile — McGowin-Lyons Hdwe. & Supply Company

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Richmond — Industrial Supply Corp.
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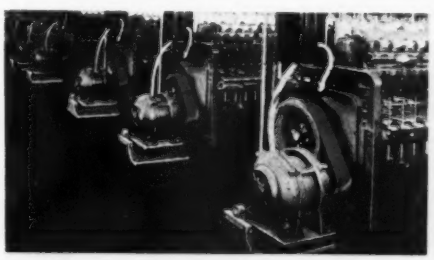
Double Life Is Why Research Leather Belting Is Preferred Over Rubber V-Belts for Pivoted Base Drives

Belt life is longer with Research Leather Belting due to:

1. high frictional surface—less tension required to grip pulleys
2. greater pliability—less internal wear due to flexing

"Fifty Reports on Mechanical Power Transmission from Motor Drive to Industry" (Robert Drake) proves that a first-quality leather belt will last at least twice as long as a rubber V-belt on a corresponding pivoted base drive.

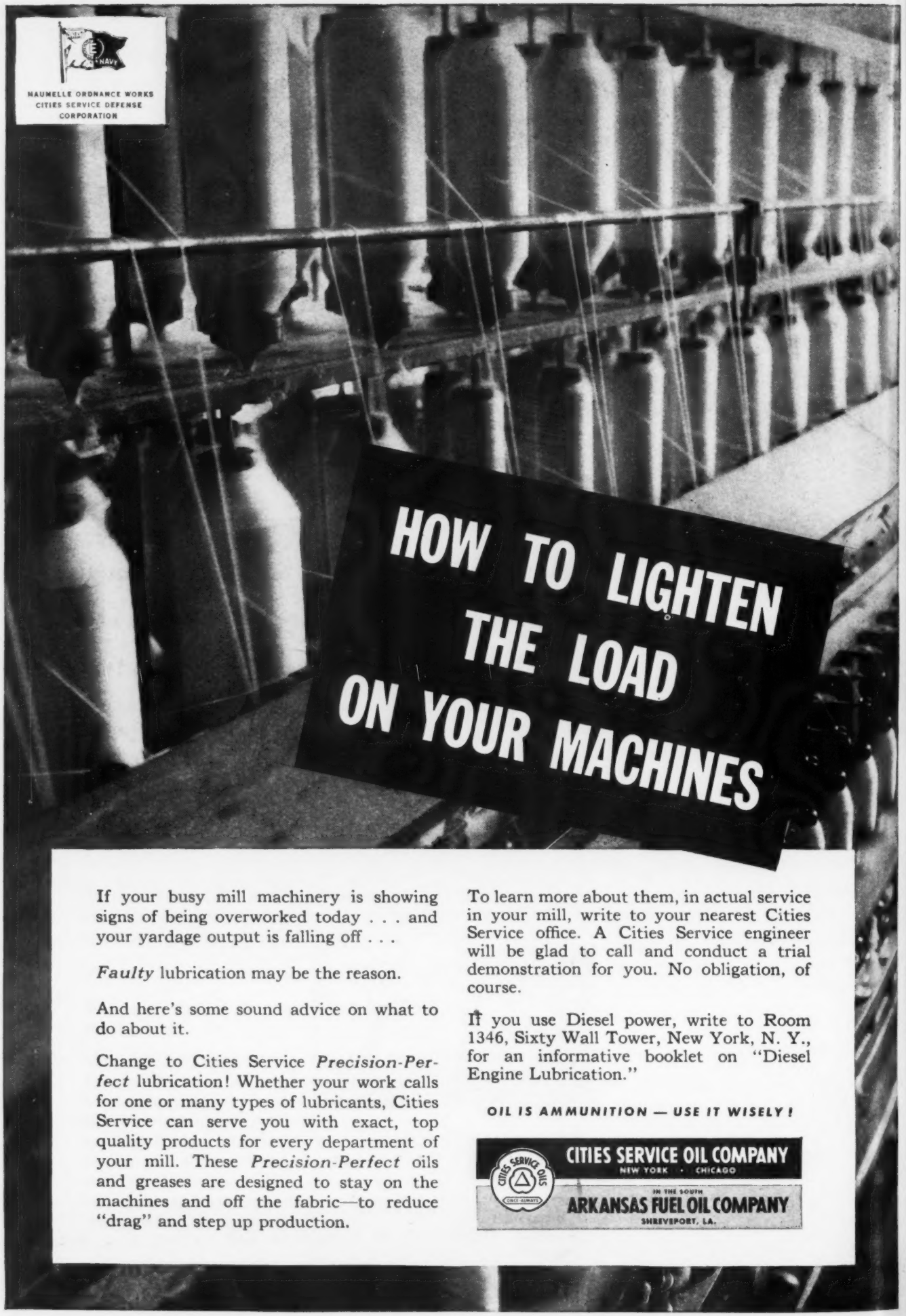
And since Research is the leather industry's top belt (specified more than any other brand), it is your soundest buy for both performance and economy.



Research Leather Belting on Pivoted Motor Drive ("Production Drive")

GRATON & KNIGHT CO., Worcester, Mass.

Only leather belting manufacturer with complete nation-wide service facilities. Branches in Chicago, Cleveland, Dallas, Detroit, Kansas City, Minneapolis, New York, Philadelphia, San Francisco. See adjoining column for distributors (also listed in THOMAS' REGISTER.)



If your busy mill machinery is showing signs of being overworked today . . . and your yardage output is falling off . . .

Faulty lubrication may be the reason.

And here's some sound advice on what to do about it.

Change to Cities Service *Precision-Perfect* lubrication! Whether your work calls for one or many types of lubricants, Cities Service can serve you with exact, top quality products for every department of your mill. These *Precision-Perfect* oils and greases are designed to stay on the machines and off the fabric—to reduce "drag" and step up production.

To learn more about them, in actual service in your mill, write to your nearest Cities Service office. A Cities Service engineer will be glad to call and conduct a trial demonstration for you. No obligation, of course.

If you use Diesel power, write to Room 1346, Sixty Wall Tower, New York, N. Y., for an informative booklet on "Diesel Engine Lubrication."

OIL IS AMMUNITION — USE IT WISELY!

CITIES SERVICE OIL COMPANY
NEW YORK · CHICAGO

IN THE SOUTH
ARKANSAS FUEL OIL COMPANY
SHREVEPORT, LA.

Oven-Weighed *at 300° F.!*

CONDITIONING OVEN

THIS conditioning oven is used to attain greater accuracy in such analytical investigations as the determination of the moisture content of yarns, the rate of evaporation and polymerization, and the rate of drying of finishes. By directly weighing materials at controlled high or low temperatures and high or low humidity while still in the oven, exact control is maintained during the entire analysis. A continuous record of the sample's loss in weight during the investigation is made possible by the analytical balance connected to the weighing pans within the oven. Once a sample is placed in the oven, it remains undisturbed during drying, and weighing, eliminating loss by handling.

WHAT IS YOUR PROBLEM?

NO textile problem is too large—nor any too small to receive the attention of the trained textile chemists of the Rohm & Haas Textile Evaluation Laboratory.

Our modern laboratory is equipped with specially designed, precise testing and evaluating machines, as well as with small-scale models of all the basic textile machines.

From the initial development of a new product to the final plant processing of finished goods, the Rohm & Haas Textile Evaluation Laboratory is ready to offer the textile industry valuable guidance on many problems.

TRITONS—*Synthetic detergents, emulsifying, wetting, and dispersing agents.*

RHOTEXES—*Synthetic gums for sizing and thickening.*

DEGOMMAS—*Concentrated diastatic and proteolytic enzymes for desizing.*

RHOPLEXES—*Aqueous resin dispersions for finishing and coating fabrics.*

RHONITES—*Modified urea formaldehyde resins for textile finishing.*

PROTOLIN—*Stripping agent for wool stock and piece goods.*

FORMOPON—*Reducing and stripping agent in acid systems.*

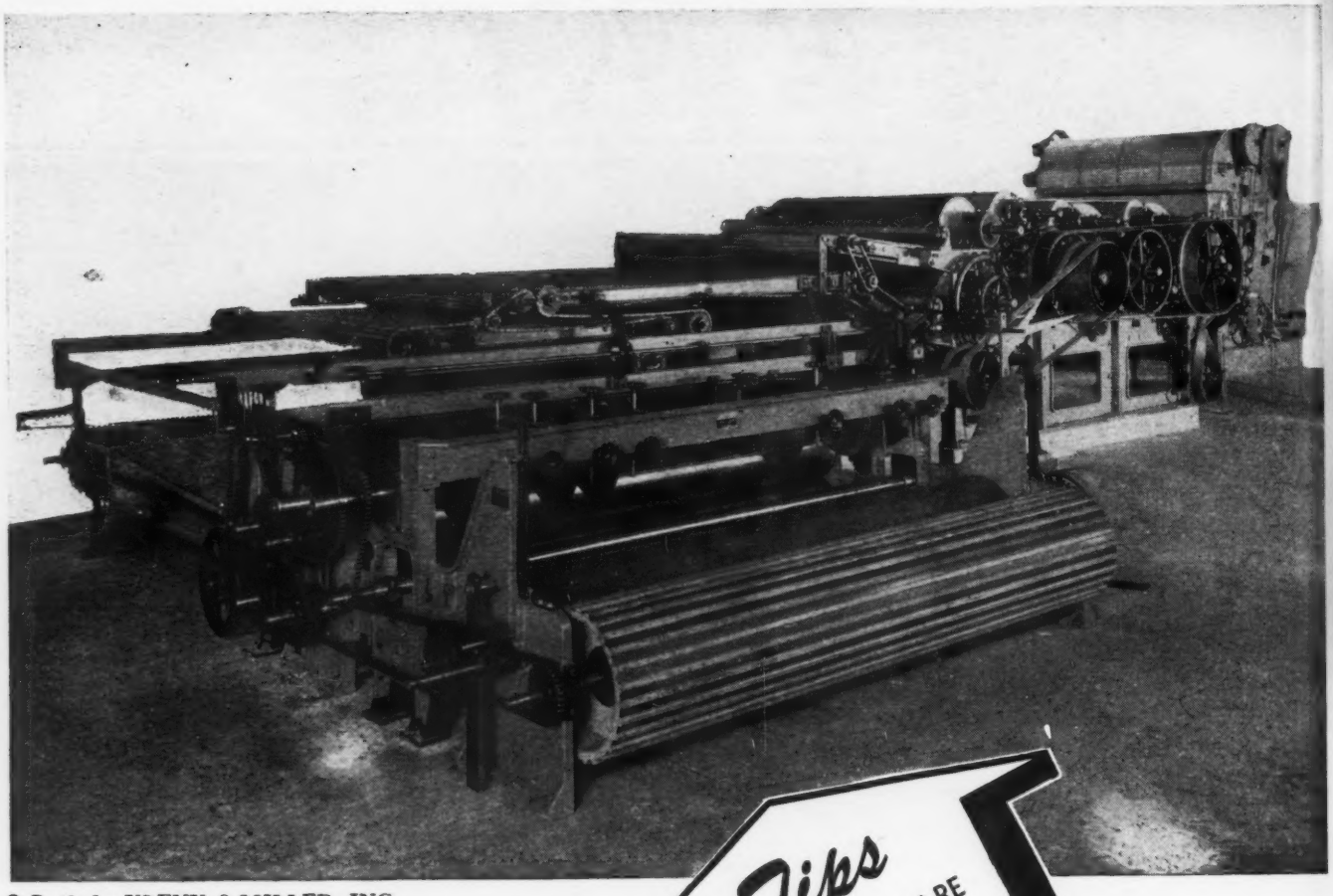
LYKOPON—*Reducing and stripping agent in basic systems.*

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA, PA.

Manufacturers of Chemicals including Plastics . . . Synthetic Insecticides . . . Fungicides . . . Enzymes . . . Chemicals for the Leather, Textile and other Industries

GARNETTS *FIGHT FRICTION WITH SKF BEARINGS*



● *Built by* KLENK & MILLER, INC.

The more SKF Bearings used on Textile Machinery today, the more materials will be produced for war use. By applying SKF's to the rollers of this complete Garnett Outfit, for instance, it is possible to improve the quality of material. Settings are maintained. Horsepower is reduced. Roller speed is retained. Always there's inherent alignment to compensate for shaft deflections, distortions or weave . . . high capacity for useful work at all times. Every moment the power's on, UP goes PRODUCTION. 5292

SKF INDUSTRIES, INC., PHILA., PA.

Tips

ON BEARING CARE

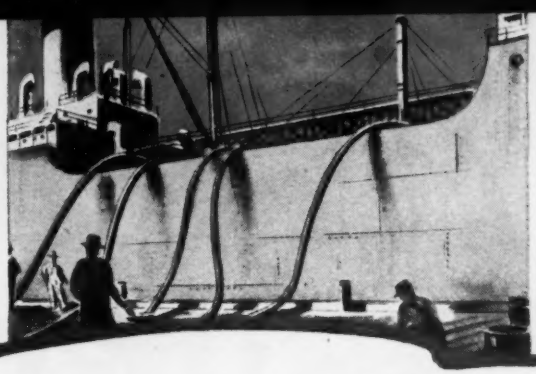
To make present equipment last longer

1. Use clean lubricant recommended by the manufacturer of this machine.
2. Avoid loads and speeds beyond those recommended by the manufacturer.
3. If necessary to remove bearings, keep them properly lubricated. Avoid the intrusion of water and dirt. Apply pressure on the inner race only. Don't hammer outer race.

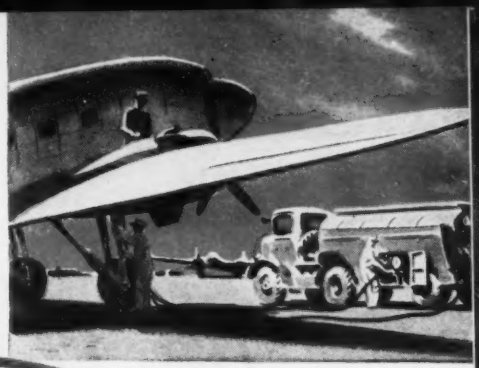
SKF

BALL AND ROLLER BEARINGS

...tic rubber facilitates well ...ing. MANHATTAN oil-proof ...ry Hose and Molded Prod... long used in all important ... Tanker time is saved by ...f synthetic rubber in Paranite ...P. Oil Hose.



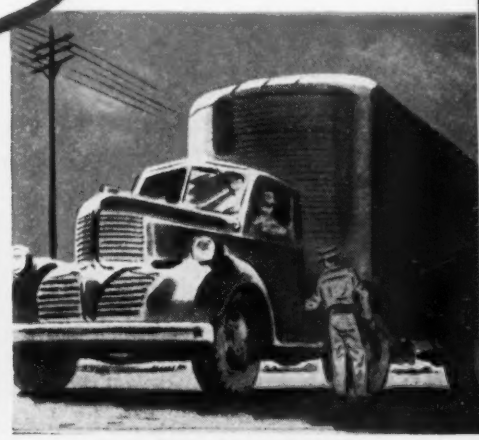
Long before Singapore



Synthetic rubber's most vital use is in airplanes—for fuel and control hose, in molded diaphragms, and in motor packings, of which MANHATTAN is a principal supplier.

Air-operated tools deliver steadier service with longer hose life when hose is lined with G.O.P. synthetic rubber.

Paint spraying speeds delivery of combat equipment. Only synthetic rubber resists action of paint and varnish.



Trucks, buses, tanks and jeeps, all have scores of oil-proof synthetic rubber parts to keep 'em rolling.

MANHATTAN was a Veteran in the use of *Synthetic Rubbers*

For years before the fall of Singapore, the use of several varieties of synthetic ...ubber was well established in the manufacture of the products illustrated. These ...ynthetic rubbers had special properties not possessed by natural rubber, such as: ...esistance to oils, sunlight and heat.

...ecause natural crude rubber was satisfactory, plentiful, and the supply seemed ...afe (Singapore was considered impregnable), no major (and costly) research and ...evelopment programs to perfect and supply synthetic rubbers as a substitute had ...een initiated.

...nder today's rising and tremendous program, widely publicized, vast quantities ...f *all-service* synthetic rubbers will be produced in months to come to replace natural ...rude rubber. Differences in physical characteristics, not easily recognizable to ...he layman, but of profound significance to the rubber technician, present highly ...versified problems in the art of compounding and using these new *all-service* ...ynthetic rubbers.

...he accumulated experience of all manufacturers in the use of special-type synthetic ...ubbers is proving very valuable in building up the art of substituting these new ...ynthetic types for natural rubber. The full and free interchange of information, ...ostered by Washington and the Industry, is speeding the results at a pace which ...ould confirm confidence in the ability and talent of the Industry to turn out ...od, usable, often better, products for War and essential civilian needs.

...ANHATTAN expects to further its already substantial contribution to this tre... mendous program of development through extensive facilities, engineering talent and a long and comprehensive experience in the use of special-type synthetic rubbers in its Paranite —G.O.P. products.

50th YEAR OF RESEARCH

Pioneering in the developments and applications of synthetic rubbers was a natural sequence to the continuous program of research which has been inherent with MANHATTAN throughout the 50 years of its progress. To the long series of contributions to Industry, more will be added.

THROW YOUR SCRAP INTO THE SCRAP!

...EEP AHEAD WITH MANHATTAN

THE MANHATTAN RUBBER MANUFACTURING DIVISION
of RAYBESTOS-MANHATTAN, INC.
EXECUTIVE OFFICES PASSAIC, NEW JERSEY

It's going to be **TOUGH** *in the days to come*

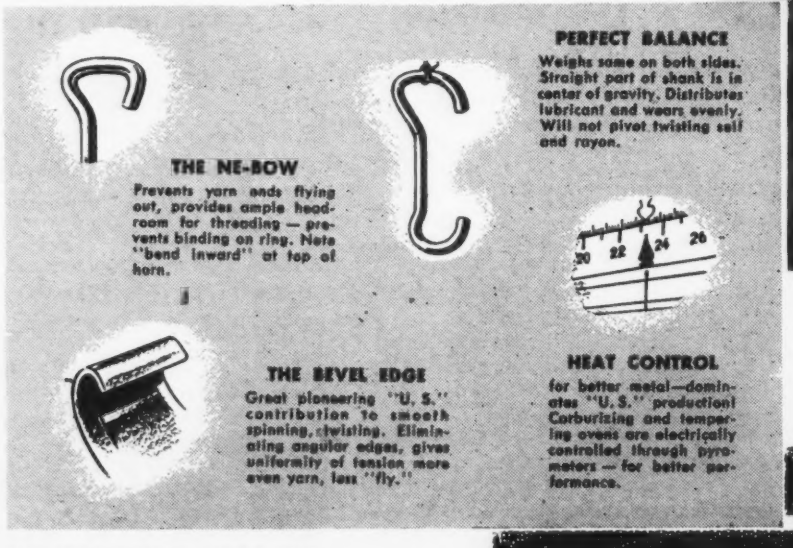
THAT'S WHY WON

This man won't waste your time...

"U. S." Representatives are real mill men themselves. They started at the bottom, have run frames, been overseers, supers. They're *practical* men, not "theorists". They know what's all about. That's why they won't waste your time or money in helping you get better service from your Ring Travelers. Send for a "U. S." Ring Traveler man — now!

SOLD UNDER THESE TRADE NAME

Bowen Round Point Travelers
Bowen Square Point Travelers
Bowen Improved Vertical Bron
Bowen Patented Bevel Edge
Bowen Flat Oval and Round Wire Travelers
Bowen Patented Ne-Bow Vertic
Bowen Patented Vertical Offs


PERFECT BALANCE
Weighs same on both sides. Straight part of shank is in center of gravity. Distributes lubricant and wears evenly. Will not pivot twisting self and rayon.
THE NE-BOW
Prevents yarn ends flying out, provides ample headroom for threading — prevents binding on ring. Note "bend inward" at top of horn.
30 22 24 26
THE BEVEL EDGE
Great pioneering "U. S." contribution to smooth spinning, twisting. Eliminating angular edges, gives uniformity of tension more even yarn, less "fly."
HEAT CONTROL
for better metal—dominates "U. S." production! Carburizing and tempering ovens are electrically controlled through pyrometers — for better performance.

BUY WAR BONDS—HELP THE U. S. RING UP MORE VICTORIES!

No. 9 OF A SERIES
BASED ON INTERVIEWS WITH TEXTILE MEN who want more production

WON'T *"pass the buck"* REGARDING THE PERFORMANCE OF "U·S·" RING TRAVELERS

No need to tell you textile mill men about the increasing toughness of the problems of equipment, materials and production, ahead of all of us for the duration — and afterwards.

There's only one thing that will lick this condition, namely, intelligent planning, with help from every source of information — and not the least important source being makers of textile equipment themselves.

Every detail counts. Take for instance Ring Travelers — our specialty. What you want from your ring travelers is service, long life, high speed operation with least trouble, isn't it? If you are using "U.S." Ring Travelers, you know from experience we don't "pass the buck" for poor traveler performance on to a lot of other factors — rings, for instance, when ring wear can be prevented by better traveler design.

No, Sir! We figure it is our job to study *all* the factors that have a bearing on traveler life and performance — and then to do two things:

(1) If suggestions are in order and will do any good, we'll give you expert unbiased advice as to whether or not, in our judgment, you are using the right type of ring (for instance) — whether it can be improved or any other change made that will reduce wear, make your travelers last longer, serve better. Or (2) we will design and manufacture to precision standards the right type of traveler that will serve best with the rings you are using, or otherwise meet your specific operating conditions. If we don't get it right the first time, we'll keep at it until we *do*. With problems of equipment maintenance looming ever larger, and metal shortages becoming more grave every day, this is no time to delay getting *all the information you can* from men who make your equipment. We offer you expert advice, and assure you it is based upon years of experience from all angles of this traveler business.

U. S. RING TRAVELER COMPANY

PROVIDENCE — AMOS M. BOWEN, *President and Treasurer* — RHODE ISLAND

RING TRAVELERS

A Traveler for Every Fibre

TRAVELERS THAT KEEP GOING!

U.S. RING TRAVELER CO.

Backed by 37 Years of
Industrial
Rubber
Know-How!
Product of 37 years of hard won "know-how" in the development of industrial rubber products, the Dayton De-Luxe Picker is *mill-proved* to be smooth, long-lived—and *tough enough* to take the *constant* pounding of high-speed looms.
MILL-PROVED TO GIVE MORE TROUBLE-FREE PRODUCTION AT LESS COST
1. Cut Picker costs up to 50%.
2. Greatly increase production.
3. Save operating time.
4. When boxed, loom stays in parallel.
5. Throwing a crooked shuttle is eliminated.
6. Jerked-in fillings reduced to a minimum.
7. Month-after-month service on high-speed looms.
The DAYTON RUBBER Mfg. Co.
Dayton, Ohio
Waynesville, N. C.
Originators and Pioneers of Synthetic Rubber Products Since 1934
MAIN SALES OFFICE
Woodside Building
Greenville, S. C.
DAYTON
D X
Dayton Pickers
A THOROBRED PRODUCT BY DAYTON
Reg. Trade Mark, The Dayton Rubber Mfg. Co.

ELECTRONIC Instruments in the industrial plants of tomorrow will supply that life-blood of change and improvement which makes for scientific progress and commercial success.

To anticipate the exacting demands of industry's future instrumentation, Brown and Minneapolis-Honeywell engineers have assumed the obligation of leadership in pioneering new developments for the measurement and control of industrial processes.

THE BROWN INSTRUMENT COMPANY, 4509 WAYNE AVENUE, PHILADELPHIA, PENNSYLVANIA
DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR CO.
MINNEAPOLIS, MINNESOTA, AND 119 PETER STREET, TORONTO, CANADA
Wadsworth Road, Perivale, Middlesex, England — Nybrokajen 7, Stockholm, Sweden

Instruments by **BROWN** *and Controls by*

MINNEAPOLIS-HONEYWELL

POUR

TYCOL

SCIENTIFICALLY

POINT*

* This is #3 of a series of informative messages concerning the meaning and significance of commonly used tests and terms employed to describe the characteristics of lubricating oils.

T I D E W A T E R L U B R I C A N I A

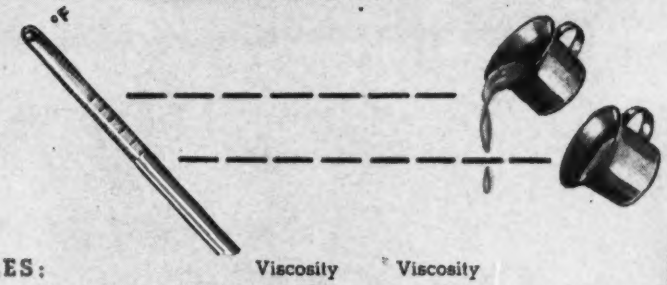
DEFINITION: The pour point is the lowest temperature at which the oil will pour or flow when chilled without disturbance under definite prescribed conditions.

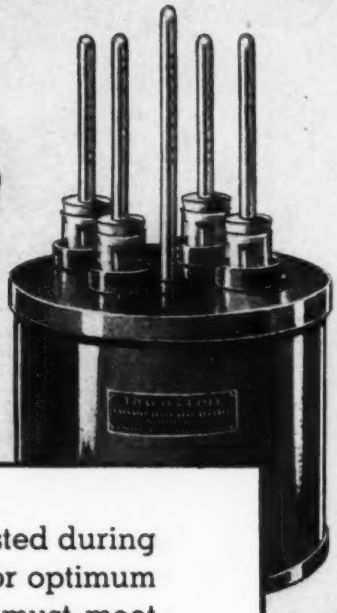
TEST: Following a carefully prescribed procedure with standardized equipment, the oil is chilled in a test jar or a corresponding 4 oz. sample bottle. At each oil temperature reading, taken at 5° F. intervals, the test jar is removed and tilted just enough to ascertain whether or not the oil is still fluid.

A temperature point will be reached at which the oil shows no movement when the test jar is held horizontally for exactly 5 seconds. The pour point is the temperature 5° F. above this "non-fluid" point.

SIGNIFICANCE: The pour point is an indication of the temperature below which it may not be possible to pour oil from its container, or below which it may not flow in gravity lubrication systems. This may be due either to partial separation of wax crystals forming a spongy network or to congealing of the oil itself.

Therefore the pour point bears no relation to the viscosity of the oil at higher temperatures. Neither does it indicate the pressure flow, or the tendency to "channel" at temperatures below the pour point.





EXAMPLES:	Viscosity at 210° F.	Viscosity at 32° F.	Pour
Paraffine Base Lubricant....	70	12,000	25° F.
Napthenic Base Lubricant..	70	50,000	0° F.

Tycol lubricants are rigidly controlled and tested during manufacture to the required characteristics for optimum performance. Among many other tests they must meet the pour point requirements of the individual application.

DRUMS! DRUMS! DRUMS!
War needs make it extremely important that all empty drums be returned immediately.

TIDE WATER ASSOCIATED OIL COMPANY

Eastern Division: 17 Battery Place, New York
Principal Branch Offices: Boston, Philadelphia, Pittsburgh, Charlotte, N. C.
MAKERS OF THE FAMOUS VEEDOL MOTOR OIL

INDUSTRIAL LUBRICANTS

ENGINEERED FOR EVERY INDUSTRIAL USE

L. F. Dommerich & Company

Executive and General Offices

271 MADISON AVENUE
NEW YORK, N. Y.

Telephone: AShland 4-8650

FACTORS

For Manufacturers and Merchants

Inquiries as to our services solicited

●

ESTABLISHED 1840

I want you to know that I am living and working for the day when you will come back

All my love

Jane

P.S. Jim, remember the little house on Cherry Street that always seemed to be built just for us? When you went away I almost gave up hope, but now that I am working and putting every dollar I can possibly spare into War Bonds, the day when we will have one just like it seems closer than ever

To fight...and save...and plan for the future—that is the American way of keeping the heart strong and the head high in this world at war. Fortunately, all of us have the privilege of helping our men at the front *and* saving for the future through the purchase of War Bonds. Remember, nothing you can buy today helps your country so much or offers you greater promise of security.

THE TORRINGTON COMPANY, Torrington, Conn.

Makers of Torrington Spring Beard and Latch Needles

The Searchlight got a bright idea from the Outboard Motor

OFFHAND, you wouldn't think there was anything in an outboard motor that could make the going easier for an anti-aircraft searchlight. In designing "outboards," the chief requirements are small space and high load capacity. So builders of outboard motors chose the Torrington Needle Bearing—it's unusually compact for an anti-friction bearing, and noted for high load capacity.

In the anti-aircraft searchlight, size of parts is a secondary consideration, so long as the equipment is transportable. Yet searchlight designers, ever striving for quicker response in locating enemy aircraft, welcomed the Needle Bearing as eagerly as outboard motor manufacturers. And not merely for its high load capacity, which helps prevent overloading and breakdowns, or low coefficient of friction, permitting crews to swing a searchlight's beam into immediate action at the first warning signal.

There's the Needle Bearing's reliable performance, for example—an invaluable feature when enemy planes are overhead—its effective system of lubrication, which enables the bearing to run for long periods without *any* attention at all—and its ready availability, helping to provide our Armed Forces with enough and on time.

THERE MAY BE AN IDEA HERE FOR YOU, TOO, in planning your product's post-war designs. Savings in weight, compact design, infrequent lubrication, dependable operation—these are features your regular customers most likely will insist upon after the war, and the Needle Bearing has every one of them, as well as low cost and ease of installation. Now is the time to "iron out," with the help of Torrington engineers, the details in adapting the Needle Bearing to your particular applications. For preliminary information on sizes, ratings, and typical applications, send for Catalog No. 116.

NEEDLE BEARINGS FOR ALL PURPOSES

LOOSE ROLLERS are produced in a range of sizes for assembly into low-cost, high-capacity anti-friction bearing units. They are particularly adaptable to applications where volume permits installation of the necessary equipment.

NEEDLE BEARINGS are complete, self-contained units consisting of a full complement of rollers and a thin, hardened outer race. They offer the advantages of small size, low cost, high capacity—and are easily, quickly installed.

QUILL BEARINGS consist of a full complement of rollers and a relatively heavy hardened outer race. They are furnished with or without inner races. Quill Bearings are adaptable to heavier load requirements than Needle Bearings.

THE TORRINGTON COMPANY

Established 1866 • Torrington, Connecticut, U. S. A.

Makers of Needle Bearings and Needle Bearing Rollers

New York	Boston	Philadelphia
Detroit	Cleveland	Seattle
South Bend	San Francisco	Chicago
Los Angeles	Toronto	London, England

LET'S GO! KEEP 'EM FLYING!

TORRINGTON NEEDLE BEARINGS

RE-LIGHTING

the new manpower / production *requirement*

OPERATION STUDY SHEET

Working Conditions *Poor light, caused by improperly located lamps. Heavy shadows on work area confuse and slow up worker... considerable spoilage-- accident hazard.*

Machine No. *349*

Capacity

Size

Department

Vital to reduce rejects, increase production

Operation study sheets all too often record "poor light" as a major cause of poor quality production—of too many units that cannot pass inspection. This condition is particularly noticeable on night-shift work because—

Most plants operating today were designed and built for peacetime, *daylight* working schedules. Wartime production demands night work; and *lighting based on daylight conditions is inadequate to serve the needs of night workers.*

The answer to this problem is *re-lighting.* You can quickly, easily, and with little expense increase the efficiency of your present lighting equipment by re-locating lamps to eliminate glare and shadow, increasing lamp wattages where necessary, or installing additional equipment to insure uniform lighting levels throughout your plant. A Silv-A-King lighting engineer can tell you exactly what is necessary.

Silv-A-King has specialized in industrial lighting for 22 years. Silv-A-King quality equipment (fluorescent or incandescent) plus a Silv-A-King "engineered layout" makes an unbeatable combination.

Send for your copy of our 16-page book: "Light Is An Essential Production Tool"

BRIGHT LIGHT REFLECTOR COMPANY, INC.
306 Morgan Avenue, Brooklyn, N.Y.

SILV-A-KING

SILV-A-KING MAKES *Light* WORK FOR YOU

AMERICA'S process industries are racing the hands of the clock, speeding the production of vital materiel. Acid handling equipment must stay *on the job*. And in many instances Tellurium Lead is helping to keep it there.

* * *

One service in which Tellurium Lead has been used to advantage is where equipment lining or piping is subjected to stress.

In certain cases of this kind Tellurium Lead has been found to stand up longer than other corrosion-resistant materials.

This longer life results, among other causes, from Tellurium Lead's ability to *work-harden*. Physical stress actually toughens this metal, increases its tensile strength, and makes it more fracture resistant than before.

The practical advantages of this capacity to self-strengthen are obvious. When a Tellurium Lead lining is turned over the top of a tank, or when a Tellurium Lead pipe line is bent or flanged, the metal tends to become stronger rather than weaker at the point where it is worked.

In the same way, operating stresses, such as stretching, bending or pressure, have a tendency to toughen Tellurium Lead—give it added strength *where strength is needed*.

* * *

Another frequent requirement of acid handling equipment is resistance to vibration. The resultant fatigue stresses, acting in combination with corrosion, are more disastrous than either factor alone.

To meet this condition Tellurium Lead not only has the acid corrosion resistance for which lead is noted but, under vibration tests, it exhibits a 60% greater endurance limit than lead without the tellurium addition.

* * *

Undoubtedly, still another factor in Tellurium Lead's resistance to corrosion under severe conditions of heat and stress is its generally finer, more uniform grain structure—shown in the accompanying photomicrographs. The surface of Tellurium Lead sheet and pipe is smoother—there is less possibility of pitting and local corrosion.

* * *

Tellurium Lead of our manufacture is time-tested St. Joe chemical lead alloyed with a small quantity of tellurium. It is available in sheet or pipe form, or fabricated in coils for heating and cooling purposes.

For further information address the nearest Company branch listed below.

USERS REPORT:

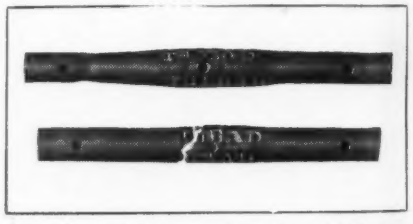
"We use Tellurium Lead regularly in our steam jet mixer heads as we find it has greatly improved resistance to crystalline fracture under conditions of mechanical stress."

* * *

"Tellurium Lead is not only easy to flange but the flanges stand up a good deal better — they seem to actually become stronger at the turn-over point."

* * *

"We have been using Tellurium Lead in steam injector pipes for acid service and find it stands up well. It has the distinct advantage of giving the added rigidity and resistance to deformation needed under the conditions present."



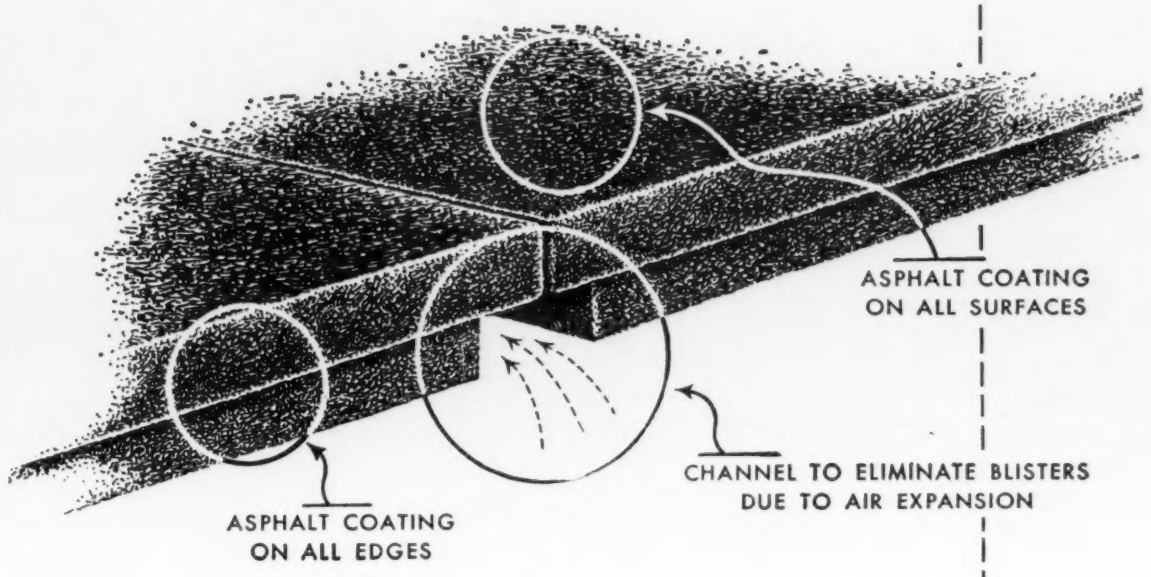
Strengthens under Stress: These pipes of Tellurium Lead (top) and lead without tellurium (bottom) were stamped with their respective names and pulled out at equal rates in a tensile testing machine. Note how the Tellurium Lead was toughened by the stamping, how it work-hardened and developed strength, whereas the lead without tellurium was weakened—and fractured.

Finer Grain Structure: Photomicrographs of Tellurium Lead (left) and ordinary lead (right), showing the generally finer, more uniform grain structure brought about by the addition of tellurium. Another significant point: In laboratory tests extruded strips of Tellurium Lead, annealed at 150°C for six months, showed no grain enlargement. Metallurgists agree that freedom from grain growth means less danger of rapid corrosion at elevated temperatures.

TELLURIUM LEAD

NATIONAL LEAD COMPANY—New York, Baltimore, Buffalo, Chicago, Cleveland, Cincinnati, St. Louis, National-Boston Lead Co., Boston; John T. Lewis & Bros. Co., Philadelphia; National Lead & Oil Co. of Penna., Pittsburgh; Georgia Lead Works, Atlanta; American Lead Corp., Indianapolis; Master Metals, Inc., Cleveland; The Canada Metal Co., Ltd., Toronto, Montreal, Winnipeg, Vancouver.

How to make sure of long-lived Roof Insulation Efficiency!



CELOTEX VAPOR-SEAL ROOF INSULATION

HAS EXCLUSIVE ADVANTAGES . . . AND IT'S AVAILABLE RIGHT NOW!

TO KEEP manufacturing processes efficient, more and more industries require "controlled weather" within their plants. Such control calls for effective roof insulation—insulation that can be depended upon to do everything it is supposed to do, for a long period of years. Celotex Vapor-seal Roof Insulation fills the bill!

It has a thermal conductivity of only 0.30 per inch thickness. It is asphalted on all surfaces and edges to repel moisture, and integrally treated to resist dry rot. It can't become water-soaked if it happens to be rained on while awaiting application. *And* the exclusive, patented channel on all edges provides for the equalization of trapped air and moisture, tending to reduce a common cause of roof blisters.

Use Celotex Vapor-seal Roof Insulation with Celotex Bonded Built-Up Roofs for the ideal combination. Both are backed by the world-wide quality reputation of The Celotex Corporation. This centralized responsibility is your assurance of complete satisfaction. Mail the coupon today!

CELOTEX
REG. U. S. PAT. OFF.

ROOFING • INSULATING BOARD
ROCK WOOL • GYPSUM WALLBOARD • LATH
PLASTER • ACOUSTICAL PRODUCTS

THE CELOTEX CORPORATION • CHICAGO

TW 5-43

THE CELOTEX CORPORATION, CHICAGO

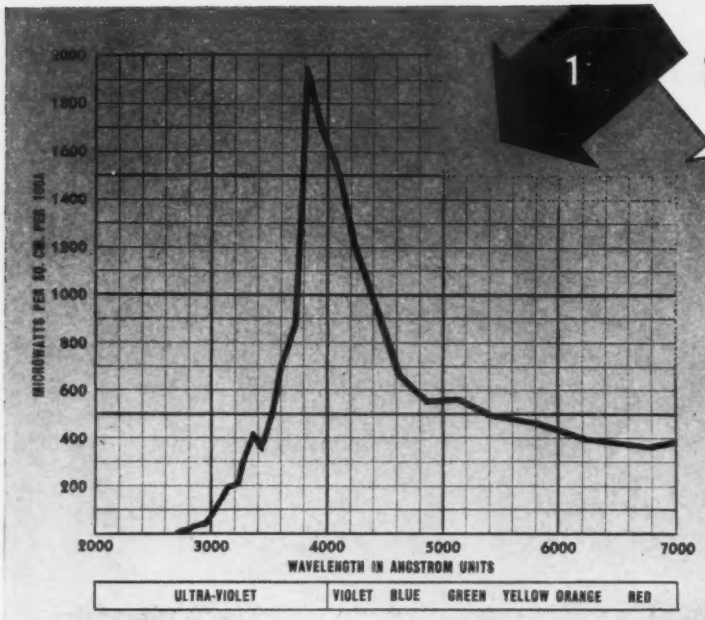
Please send complete information on Celotex Vapor-seal Roof Insulation and Celotex Bonded Built-Up Roofs.

Name .....

Address .....

City .....

County ..... *State* .....



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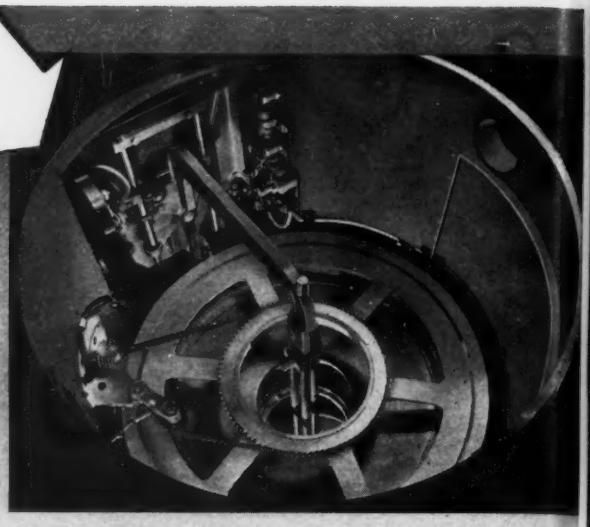


Two of Many Reasons Why

The National Type XV Unit is in Demand for Accelerated Fading of Dyed Fabrics . . .

TRADE-MARK

1 TYPE OF LIGHT SOURCE. This accelerated fading machine utilizes the flame type carbon arc burning "National" *Sunshine* carbons. This arc provides radiation recognized as the closest approach to the full spectrum of natural sunlight available from any light source of suitable intensity. The spectral energy distribution curve above shows the similarity of radiation from this arc to natural sunlight, especially in those regions of the spectrum most important in the fading of colored materials.

2 METHOD OF MAINTAINING LIGHT INTENSITY. Arc wattage, upon which quality and uniformity of radiation depend, is closely regulated in the XV unit by the most accurate method of arc control. This consists of a mechanism built around a reversible motor governed by a solenoid operated relay. Deviation from the selected current value is never more than a fraction of one ampere. This type of arc control is used on carbon arc lamps designed for the most exacting constancy of energy output, such as therapeutic applications, irradiation for production of Vitamin D and others.

SCIENTIFICALLY DESIGNED TO PERFORM THESE 4 FUNCTIONS

1. To duplicate the fading effects produced by exposure to natural sunlight. 2. To accelerate fading action. 3. To accurately control test conditions and permit their reproduction at any time, independent of weather or season. 4. To operate continuously for a 24 hour period.

NEW DESCRIPTIVE BULLETIN. Gentlemen: Please send me your new literature on the "National" Type XV Accelerated Fading Unit.

Name _____ Position _____

Address _____

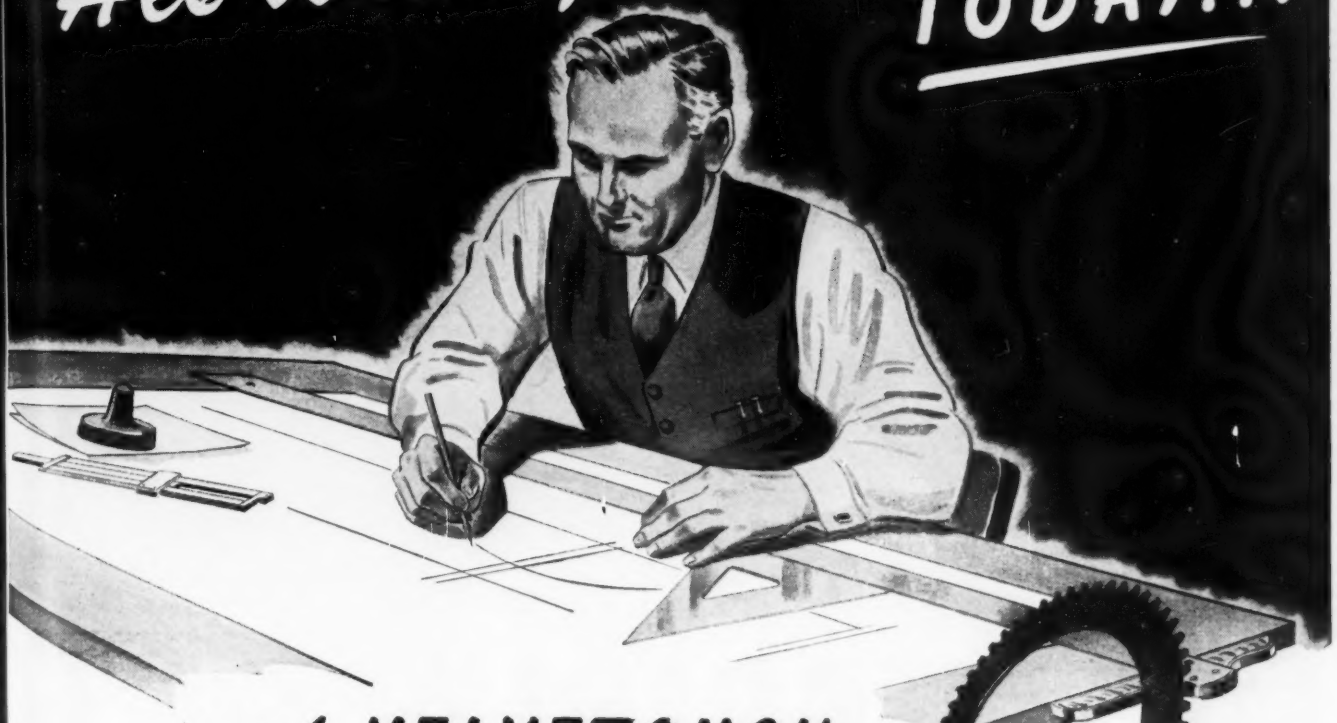
The National

TRADE-MARK

TYPE XV ACCELERATED FADING UNIT

NATIONAL CARBON COMPANY, INC.
Unit of Union Carbide and Carbon Corporation
UCC
CARBON SALES DIVISION, CLEVELAND, OHIO
General Offices: 30 East 42nd St., New York, N. Y.
Branch Sales Offices: New York, Pittsburgh, Chicago, St. Louis, San Francisco

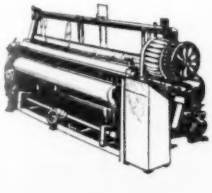
He's Writing the Peace TODAY...

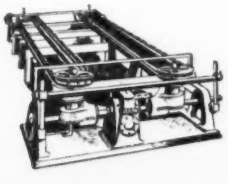


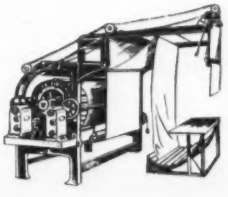
with VELVETOUCH

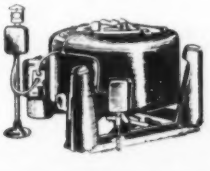
Tomorrow's textile machinery will be even more rugged and efficient — thanks to wider use of VELVETOUCH clutches and brakes. Today, while most of the output of this remarkable friction material is going into the war effort, engineers in a hundred drafting rooms are designing post-war looms, tenter frames, fulling machines, extractors and warpers that will do more work at lower cost. In all brake and clutch applications they will utilize the many superior qualities of VELVETOUCH which give you assurance of smooth, positive operation.

VELVETOUCH is an all-metal friction material—a combination of sintered powdered metals, compressed and welded to a solid metal backing. Can be supplied in a wide variety of constructions for all clutch and brake applications in textile equipment.









TRADE MARK REG U S PAT OFF.

Velvetouch

THE S. K. WELLMAN CO.

1374 EAST 51ST STREET
CLEVELAND, OHIO, U.S.A.

PIONEERS IN PUTTING POWDER METALLURGY TO WORK FOR INDUSTRY

LUBRIPLATE SAVES 3 WAYS

LUBRIPLATE lubricants had to be good to earn the place they enjoy in the Textile Industry.

Yes, they save in three ways. They permit top speed operation of machines. They reduce shut-down for repairs to a minimum. They save on the costly replacement parts that are so hard to get these days.

LUBRIPLATE lubricants range from the lightest spindle oil to the heaviest greases. Each does a specific job in the Textile Industry better than a conventional lubricant.

Water-resisting types of LUBRIPLATE set a new standard of lubrication under humid conditions. Ball bearing LUBRIPLATE is so effective that mills that have used it believe they could not operate without it. LUBRIPLATE Lubricants have brought in unsolicited testimonials from all over the country.

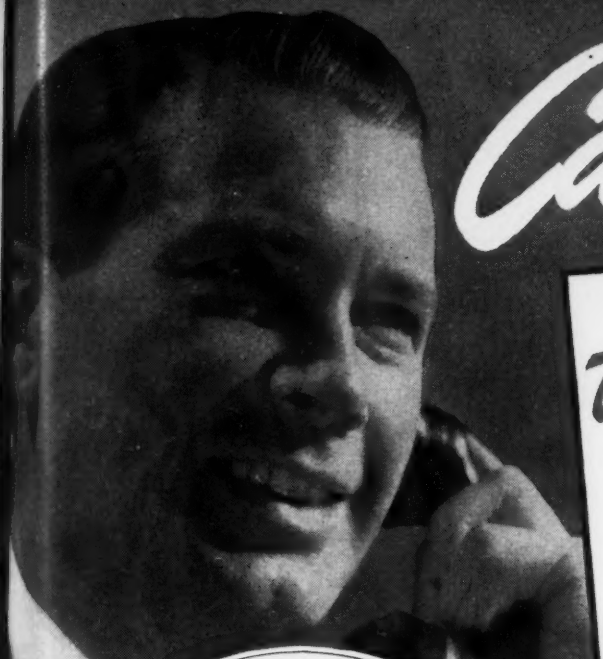
Under today's conditions, you need LUBRIPLATE more than ever before. Let us send you a free copy of "The LUBRIPLATE Film" written especially for the Textile Industry.

LUBRIPLATE DIVISION

FISKE BROTHERS REFINING COMPANY

NEWARK, N. J. **SINCE 1870** TOLEDO, O.

WRITE FOR THE NAME OF THE DEALER NEAR YOU



Call us

for GENERAL PURPOSE STEELS

Steel products, tools, machinery and equipment

Like yours, our first job is to speed war production. So, if your production on a war job is in danger of being slowed down for want of some piece of steel—call our nearest warehouse. Many such calls have kept wheels turning.

Although our stocks are not what we wish they were, what we have can be yours—in a hurry—subject, of course, to priority restrictions.

If we don't have what you need, we'll do everything we can to help you find a source of supply. So try us—note our phone and teletype numbers below, at the left.

for NATIONAL EMERGENCY ALLOY STEELS

These new alloy steels were developed as substitutes for the old style alloy steels to save critical materials such as nickel and chromium. They cover a wide range of properties—were especially designed to meet present conditions. In fact, many "NE" steels are actually out-performing the steels previously used.

We welcome your inquiries and will gladly assist you in determining the grades best suited to your needs. Telephone, write or wire the warehouse nearest you.

for AIRPLANE MATERIALS

Our Chicago Warehouse has been designated by the War Production Board as a warehouse to distribute the following aircraft products:

WD-X-4130 Sheets, *Open Hearth, Normalized, Pickled and Oiled to Spec. AN-QQ-S-685, Condition N. All gauges .016 to .50 sheets 18 x 72".*

Stainless Steel Rounds, *Spec. AN-QQ-S-771.*

Stainless Sheets—*Spec. AN-QQ-S-772. Spec. AN-QQ-S-757.*

These materials are for use in airplanes and available at our Chicago Warehouse only. If you are eligible for these materials, phone, write or wire: United States Steel Supply Company, P. O. Box MM, Chicago, Ill. Telephone, BRUnswick 2000—Teletype CG. 605.

UNITED STATES STEEL SUPPLY COMPANY

USS

STEELS

SERVICE

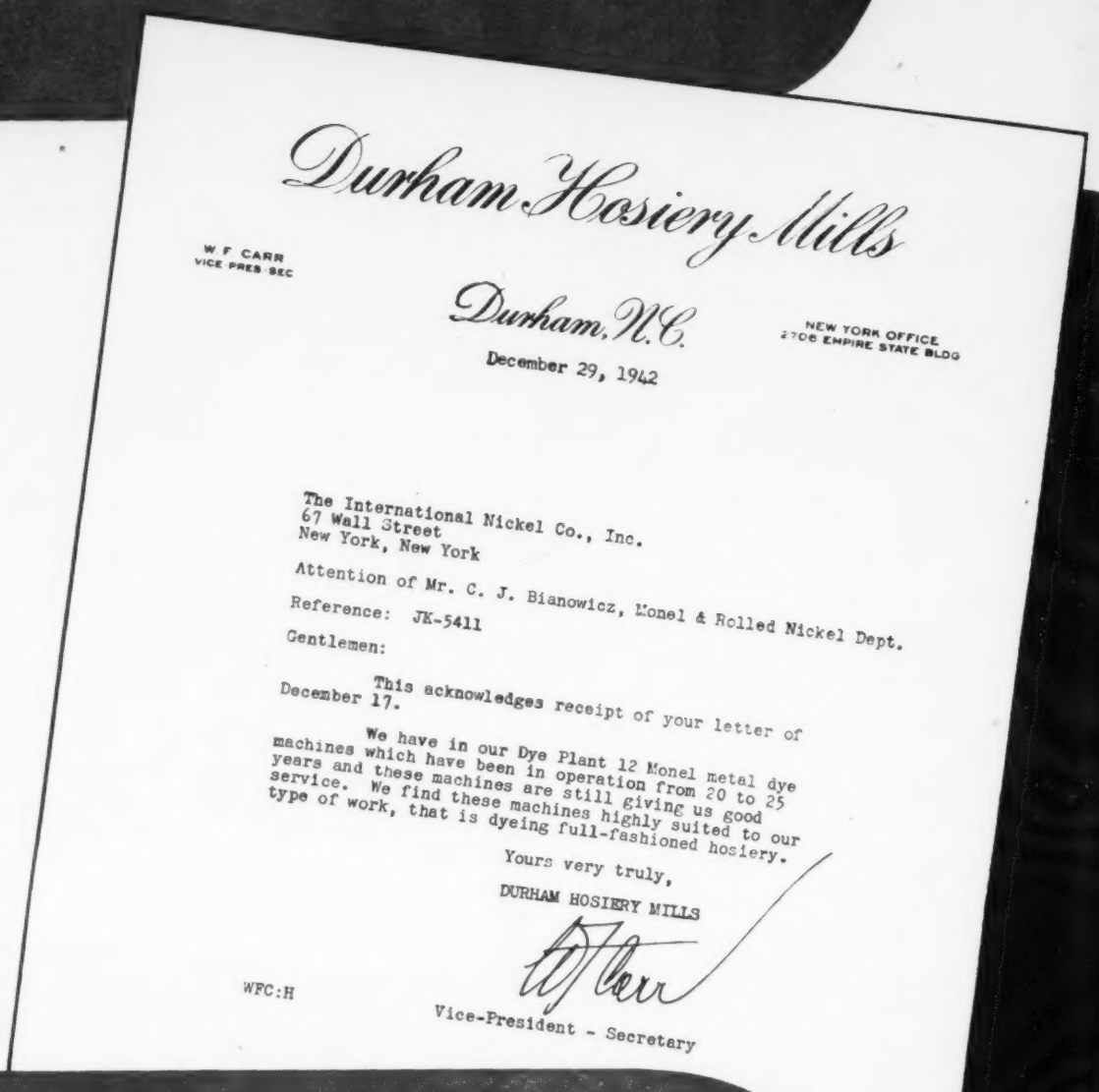
CHICAGO,	1319 Wabansia Ave.,	BRUnswick 2000
	P. O. Box MM	*Teletype CG. 605*
BALTIMORE,	Bush & Wicomico Sts.,	GILmore 3100
BOSTON,	176 Lincoln St., Allston,	STAdium 9400
	P. O. Box 42	*Teletype BRTN. 10*
CLEVELAND,	1394 E. 39th St.,	HEnderson 5750
		Teletype CV. 153
NEWARK, N.J.,	Foot of Bessemer St.,	BIgelow 3-5920
	P. O. Box 479	REctor 2-6560
	Teletype NK. 74	BErgen 3-1614
PITTSBURGH,	1281 Reedsdale St., N.S.,	CEdar 7780
		Teletype PG. 475
ST. LOUIS,	21st & Gratiot Sts.,	MAin 5235
		Teletype SL. 384
TWIN CITY,	2545 University Ave.	NEstor 2821
	St. Paul, Minn.	*Teletype STP. 154*

UNITED STATES STEEL SUPPLY COMPANY

(formerly Scully Steel Products Company)

UNITED STATES STEEL

It's news when World War I equipment is *not outmoded* in World War II



Durham Hosiery Mills

W. F. CARR
VICE PRES. SEC

Durham, N.C.

NEW YORK OFFICE
2706 EMPIRE STATE BLDG

December 29, 1942

The International Nickel Co., Inc.
67 Wall Street
New York, New York

Attention of Mr. C. J. Bianowicz, Monel & Rolled Nickel Dept.

Reference: JK-5411

Gentlemen:

This acknowledges receipt of your letter of December 17.

We have in our Dye Plant 12 Monel metal dye machines which have been in operation from 20 to 25 years and these machines are still giving us good service. We find these machines highly suited to our type of work, that is dyeing full-fashioned hosiery.

Yours very truly,

DURHAM HOSIERY MILLS

WFC:H

Vice-President - Secretary

Durham Hosiery Mills first installed Monel textile equipment during World War I.

Little did they then realize that another world conflict was to engulf the U. S.—and that when it did, nearly 25 years later, their Monel equipment would still be up-to-date . . . would still be giving good service.

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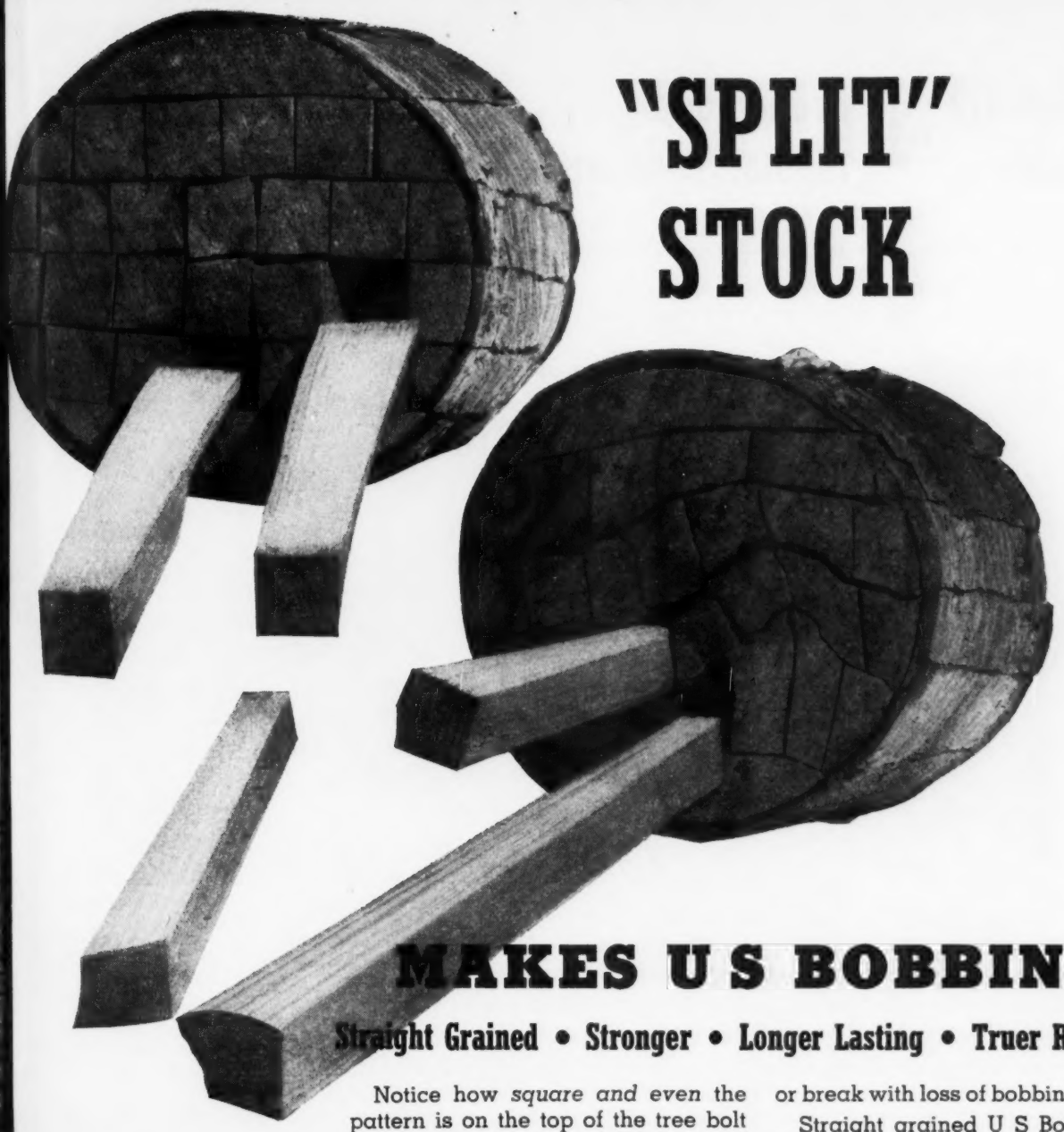

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Textile World

MAY, 1943 • VOLUME 93 • NUMBER 5

A McGRAW-HILL PUBLICATION

TEXTILE WORLD (formerly *Textile World Journal*) with which are combined *Textiles, Posselt's Textile Journal* and *Textile Advance News*. Published monthly. United States and Possessions and Latin American Republics, $1.50 a year; Canada and all other countries, $2, U. S. currency or 12 shillings. Single copy 25c. Annual index in "Textile World Yearbook & Catalog."

Of this issue 15,890 copies were printed

Member of Audit Bureau of Circulations

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IN THE NEXT

A SPECIAL FEATURE of the June issue will be a comprehensive discussion of the fundamentals of drafting, with particular emphasis on improvements in the drafting processes and techniques which are necessary if textile mills are to produce yarns of higher strength, better appearance, and greater durability. An especially timely article scheduled for June is on the use of uniforms for women workers.

Tying in with the increased demand by the Army for herringbone twill, Part V of TEXTILE WORLD's "Manual of Military Fabrics" will present detailed information on manufacturing and finishing this fabric. Another technical article tentatively scheduled for June covers pointers on maintenance of woolen mill equipment.

The enlarged "Kinks" department which is to be found in this issue will be continued, and an additional department will make its bow in which free discussion of a wide range of mill problems will be presented.

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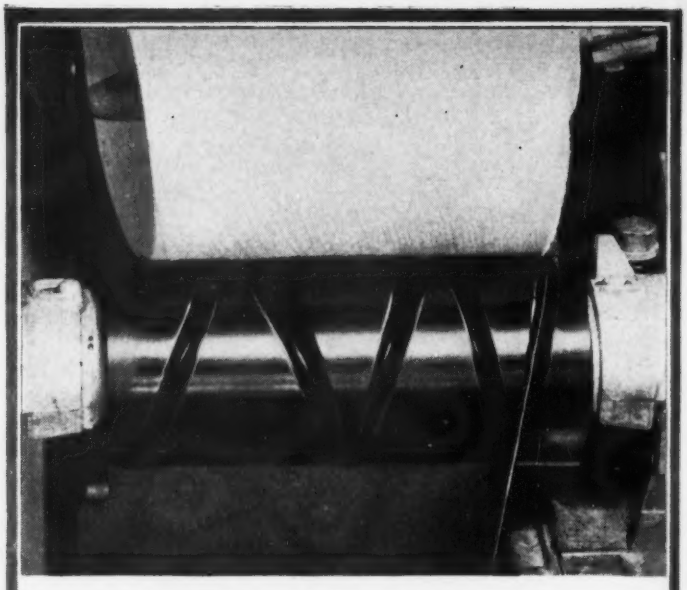

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TRANSPORTATION—a vital war factor

The effectiveness of our armed forces and civilians alike depends on the efficiency of our transportation

As the battle of Tunisia entered its final phases, with the British and American forces joining hands to crowd Rommel into his last fox hole, Hitler and Mussolini held their twelfth war-time meeting.

One important purpose of this meeting, according to the Berlin radio, was the study of a specially prepared "Survey of Continental Reserves". Topping this list of resources is the item of transportation.

Hitler has a great many headaches these days but, according to no less an authority than the Reich Ministry of Economics, "the central problem of the whole German war effort is transportation". It is, in fact, the Achilles' heel of Germany's War Machine.

The Nazis have become soberly conscious of its crucial importance and Mr. Hitler must wince when he recalls the gigantic miscalculations which led him to neglect his railways.

He counted on a short war, not a long wear-and-tear war and Germany's transportation crisis is getting more critical by the hour. It will play a vital part in its defeat.

This is a war of movement—on land, on sea and in the air. Russia's 2,000 mile battleline, R.A.F.'s 700 mile bombing raids, General Montgomery's 1,500 mile advance last November and the vast area that constitutes the theatre of war in the Pacific make this fairly obvious.

Peace will come when one side gets control over the world's supply of fuel, oil and rubber, for on these three critical materials depend all the vehicles of war—as well as of peace.

An army used to travel on its stomach. Today it travels on its fuel tank.

On the home front, transportation is no less vital. Here it is essential in getting the war workers, their raw materials and their products, to and from the mines, mills and factories that supply our armed forces and those of our Allies. Transportation is a major factor in the nation's ability to out-produce its enemies. Every known method, every type of vehicle becomes essential, for no single group of carriers, freight or passenger, can meet all our needs.

The railroads opened the vast resources of our nation and continue to be the backbone of our transportation system. Today they are doing the greatest job in their history. They are hauling more tons of freight more miles than ever before—33% more than in 1941 and 55% more than in 1918, peak year of the first World War. They are carrying more passengers more miles than ever before—80% more than in 1941 and 24% more than in 1918. They are getting more work out of each car, each engine, and each mile of track than ever before. Private operation of railroads is proving far more effective and efficient in this war than did government operation in the last war.

This is the eleventh of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers, and in daily newspapers in New York, Chicago and Washington, D. C. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

In contrast to Hitler's Germany, the managers of the American railroads have not neglected their plant except where government priorities forced them to do so. They are turning in an unprecedented performance despite the long starvation period to which they were subjected. During the first World War the total investment in the American railroad plant was about $18,600,000,000. Since then $12,000,000,000 have been spent on improvements and after deductions for scrapped facilities the net increase has been $8,000,000,000. Since the present war in Europe began the railroads have invested about $1,650,000,000 in further improvements, many of them to meet special war needs.

Convincing evidence of the railroads' flexibility in meeting the special needs of all-out war is their performance in coping with the movement of oil to the East Coast. In January 1942, one month following Pearl Harbor, the railroads delivered to the East Coast by tank car less than 100,000 barrels daily. By December they had stepped this up to more than 740,000 barrels and during the week ended April 3, 1943 they

averaged more than 900,000 barrels per day. By the end of this year they are shooting for the goal of one million barrels a day.

Unlike Germany we have not attempted to control the development and growth of motor transportation according to the "intuitions" of one man but have wisely left it in the hands of experienced competition. That is how our highway transportation system came into being. Growing public acceptance has made it an essential part of our national economy.

The motor vehicle, its limitations set only by the improved highway and the supply of fuel and rubber, has developed to undreamed of proportions. Up to a year ago private automobiles consistently moved more people more miles than *all public carriers combined.* Buses have become an accepted means of mass transportation. Local electric and interurban railways in many cases were converted to bus lines and trucks took over the local freight services. Under these improved operating conditions traffic volume increased. When the war in the Pacific made it necessary for us to conserve our supply of rubber and the U-boat depredations in the Atlantic throttled the flow of gasoline to the eastern seaboard, our motor transport was forced to grapple with the toughest problem that ever had confronted it since it became so vital a factor in the every day transportation.

The "share-the-ride" idea recognizes the need of conserving gas, oil and rubber. This particularly applies to buses, for wherever groups can be assembled for a common destination, buses can be used most effectively. The intercity bus performs for the rural areas the same service that the local bus renders for the residential areas of our cities.

Reorganization of railroad schedules, adaptation of motor transport, rearrangement of working hours, all have contributed to provide a flexible transportation service for men and materials to meet the critical needs of the war effort. Twenty thousand intercity buses are handling 635 million passengers a year which is 69 per cent more than in 1941. The fact that these buses carry a relatively larger percentage of the total coach passenger business than their seating capacity would indicate suggests that here, too, we are getting a more efficient use of these vehicles in terms of passenger loads carried. It is fortunate to note that the geographic location of most intercity bus lines does not coincide with that of the railroads but rather supplements it.

The contribution which the urban transport industry is making to the war effort becomes apparent when we consider that buses, trolley buses and street cars today carry passengers at a rate which promises to exceed the impressive total of 21 billions, as compared with 18 billions in 1942 and an average of 13½ billions for the period 1936 to 1941. And this the industry is accomplishing with a minimum of added equipment and despite a serious drain on its manpower.

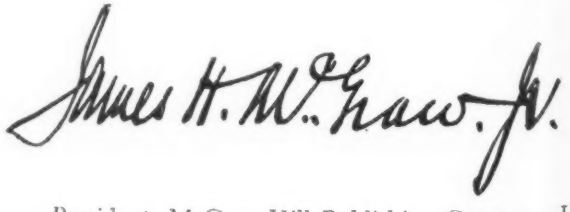
The truck lines, too, are setting all-time records. They have rearranged their schedules, eliminated circuitous routes and coordinated their services with those of other carriers. As this is written, contract truckers with the cooperation of the Office of Defense Transportation are trying to eliminate the empty return trip.

The transportation industry as a whole is face to face with the biggest job in its history. Increasing traffic loads, with little if any new equipment, difficulty in obtaining essential maintenance materials and a growing shortage of manpower, combine to make it that. While federal authorities, acting through the Office of Defense Transportation, took prompt cognizance of this condition, froze equipment and otherwise acted to conserve the vehicles then in service, it was not possible to add sufficient vehicles to keep pace with the increased traffic demand. However, the O.D.T. did lend impetus to the movement for staggering hours of work thereby spreading the peak loads and thus increasing the carrying power of existing fleets of vehicles in city service.

As we review the problems involved in meeting our transportation needs it is evident that we cannot depend upon new equipment alone for their solution. Lend-Lease is taking a considerable share of our much needed output of transportation equipment. The immediate job is up to the rank and file of the transportation industries. It is up to their resourcefulness and devotion to their job. The operating men out on the road, the men in the shops who keep the equipment going, who make the most of the metals and other materials they can have, who salvage, conserve and economize . . . these are the men who must bear the burden of our war load.

Theirs is a dramatic story, a story of cooperation and coordination . . . of ever increasing capacity on a shoestring allowance of new equipment.

For this is a war of movement. According to Joseph B. Eastman, Director of Defense Transportation, both the passenger and the freight traffic on the railroads is to a large extent war traffic — the transportation of troops and civilians on war business, the movement of food, raw materials and finished products required for the prosecution of the war. As Mr. Eastman put it, delayed arrival of troops at embarkation ports, delayed delivery of vital war materials could even conceivably mean the loss of men at the fighting front. And what Director Eastman says of the railroads applies to all forms of transportation. Transportation by bus, by street car, by truck, by train, by ship and by plane . . . all play a vital part in the achievement of victory . . . on the home front and on the fighting front which relies upon it.



President, McGraw-Hill Publishing Company, Inc.

DOUGLAS G. WOOLF, EDITOR

Stand Up and Be Counted!

JUST AS THE WAR "all depends on me," so will post-war "all depend on me." That is the conviction every textile manufacturer must reach if he is to survive.

More deadly than antiquated machinery is antiquated thinking. Until each one of us realizes that fact, there will be little chance of an assured future. And, remember, this future we are trying to make secure is not just yours and mine, but that of our children: of our boys who will come back to find jobs, we hope, and of the small-fry who will just about mature into cannon-fodder for World War III if we don't do something about it *now*.

We have met a lot of tough guys in our time, but to date (after 52 years of living) we have never met a single man or woman who was tough enough not to want for his or her young children a sure future, a clear path—leading up to the White House, in theory. So we take it for granted that every reader of this editorial is a "prospect" for a good sales argument on how to make the world safe for our children.

HERE IS THE SALES ARGUMENT: The one thing that will insure World War III, in which the Billys and Peggys and Jacks (whom we all cherish) will be involved, is a clinging to past thoughts, past hopes, past fetishes, past phobias. The one thing that will make the world safe for those most precious possessions of all of us, is a complete freedom of mind and thought, a complete divorce from past illusions.

This is no academic idea we are presenting here. This is no abstraction. It is the most practical answer that anyone can offer to confused minds in the vortex of a world revolution. It is the answer which was offered, but not accepted, in post-World War I. It *must* be accepted in post-World War II, if World War III is to be averted. Make no mistake about that.

What are these dead leaves, and clinging vines, which we must rake up and burn, if we are to have a new world harvest? They are: (1) a fierce nationalism based on the theory that America is bigger and better than all the other countries of the world, and consequently able to go on her own; (2) a fierce distrust of internationalism, and of world pacts pointed toward freedom of trade, freedom for under-dog nations, freedom for all races and creeds, implemented by a policing power of *all* free nations; (3) a fierce adherence to old and out-worn ideas of economics and of industrial relationships.

WHAT DOES ALL THIS MEAN to the individual textile manufacturer?

First of all, in the negative sense, it means a giving-up of certain "rights" heretofore regarded as inalienable.

Sure, all textile manufacturers would like to turn the clock back to the "good old days" when you made what you wanted to, and sold it; when no Government agency could tell you what to do; when employer-employee relationships were the concern of each individual company, without outside interference; when a tariff wall kept out international competition.

But so would our boys, sweating and dying in the four corners of the earth, like to turn the clock back.

The clock cannot be turned back. Each hour of its revolutions in the last quarter-century has made more irrevocable the march of time—more certain the world revolution which we experience today.

It is no longer a question of what you like, or what I like. It is a question of how we are going to be able to face new facts, a new world, and survive. Not survival, as we said before, for you and me, but survival for the young ones whom we chose to bring into this world. And not just *survival* for them, but a new era of opportunity. Not a return to a theoretical system of free enterprise which, in the last analysis, meant freedom for a certain class, only—but a freedom for all people.

If that, too, sounds academic, just remember that your children and mine may quite easily be the underprivileged group of the future. It is still three generations from shirt-sleeves to shirt-sleeves. This revolution is producing a new group of capitalists, and possibly a new group of casualties. Its results must be approached objectively, so that all men, women and children may at last inherit the earth.

From this day forth, all men must stand up and be counted. Those who want to be counted among the

adherents of a national, international, economic, and sociological philosophy which is now as dead as a door-nail, have that privilege. Those who want to be counted among the adherents of complete flexibility to a world revolution, also have that privilege.

The latter group of individuals may be reviled as Communists, or Socialists, or Economic Royalists; or Nationalists, or Internationalists, or Isolationists; or Liberals, or Radicals, or Conservatives, or Reactionaries —all depending upon the point of view of the reviler.

But at least the group which stands up *now* to be counted among those who know no boundary of thought or tradition, other than the boundaries of human progress, will never suffer from self-revilement.

So stand up now, and be counted!

Douglas G. Woolf

THE EDITOR SAYS

Lo, the Poor Civilian!

The principal impression one gets from a visit to Washington nowadays—and the one of most immediate interest to textile manufacturers—is the new interest in the plight of the civilian. This is not a sudden awakening; it has been slowly dawning upon WPB officials for months.

But make no mistake about it: Washington is not, and should not be, concerned over whether civilians have to be appeased. The concern is a specific one: whether the supply of civilian goods and services has been reduced to a point impairing the morale of war-workers and adding to absenteeism and production slow-downs in war plants. Evidence is accumulating that that point has been reached and passed.

The main corrective action taken to date has been the appointment of Arthur D. Whiteside as a vice-chairman of WPB in charge of civilian supply. Mr. Whiteside is an old friend of the textile industry. More than that, he is an outstanding example of the type of men who have served in Washington at great personal sacrifice and purely from patriotic motives.

It should be emphasized, however, that Mr. Whiteside's appointment is not a slur on the record of OCS.* Every responsible official in WPB recognizes that the job of OCS to date has been to *deprive* civilians of goods and services, rather than to *give* them such goods and services. Those same officials credit OCS with a vital part in making all-out war production possible, through dispensing with unnecessary civilian production.

But now the picture is different. It is now realized that the difficulties encountered by war-workers in shopping, in transportation, in laundry, in dry-cleaning, in child care, and in all the other essentials of civilized living, make necessary a new balance between war needs and essential civilian needs.

Achieving and maintaining such a balance is probably the most difficult job of tight-rope walking in Washington. If anyone can do it, Arthur Whiteside can. But he will need the cooperation of all agencies dealing with textile production and pricing in Washington, and of all companies in the industry.

* Now OCR.

The Textile Outlook

The outlook in textiles for the balance of the year and for 1944 becomes more complicated and less predictable each month.

One of the new variables connected with it is the possible revision in balance between war and civilian production outlined in the item above. Tied in with this is the new factor described in Washington lingo as "cutbacks"—which are merely cancellations of war contracts. The extent of cutbacks to date has been greatly exaggerated, we learned on our last trip to Washington. A few isolated cases, based on specific reasons, were magnified into an epidemic.

So far as military orders for textiles are concerned, there seems to be no reason to anticipate a drop, so long as we continue to induct men into the Army at the present rate. Eventually, of course, the outfitting of the initial Army will have been completed and then the volume of textiles required merely for maintenance will be much lower than the current military demand. England has passed into the maintenance stage and has experienced this contraction. We have not even reached it yet but it is one of the factors to be kept in mind, particularly by those who, in the midst of a boom, always like to think that the answer to permanent prosperity has been found.

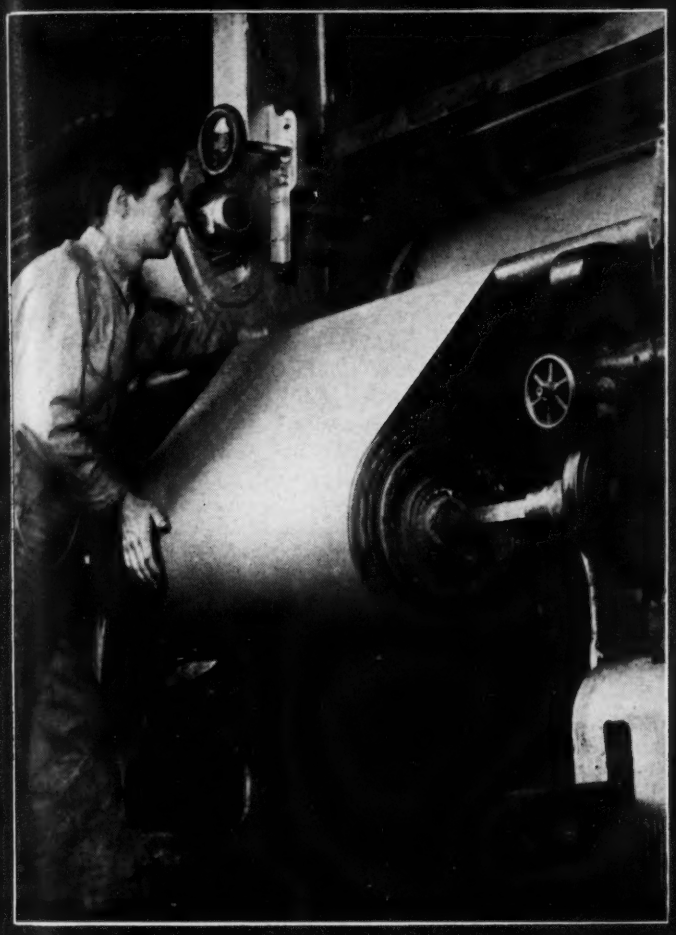
Next comes the factor which we have emphasized repeatedly in these columns during recent months—namely, our good old friend Lend-Lease. The volume of production required for that purpose will have a very definite influence on textile production, and is still among the unknowns.

Next is the question of individual purchasing power. The main worry in this connection is still concerned with the excess of purchasing power and its potential inflationary significance. It could be changed radically and immediately by a stiff enough tax program. If and when the latter comes—and it seems unbelievable that even Congress can delay it much longer—something new will have been added to the textile picture, and a negative ingredient at that.

All of the above has had to do with production only. The profit side is easier to predict. It is apparent that there is going to be less and less margin of profit in textile manufacture and in all industry for the duration at least.

The textile industry is still in a boom. There is no collapse in sight. There are, however, so many conflicting factors involving the balance among various types of demand for textiles that the wise manufacturer will keep his mind and organization continually alert to signs of change. In the midst of all-out production—which must be continued as long as a single soldier needs any article of apparel or textile equipment—the industry should be prepared for changes which will make it necessary to continue to make money on a smaller volume of business.

Finally, it must be emphasized that the above is a consideration of the short range outlook only—that is for the remainder of 1943 and for the year 1944. The post-war prospect, with the staggering possibilities of higher standards of living all over the world, and unprecedented world-wide demand, is another story.



Of the numerous developments in textile processing which have been stimulated by the demand of our armed forces for special finishes, few, if any, offer greater promise for the post-war era than do coated fabrics of various types for apparel, household, and industrial use. The greatly expanded field for coated fabrics which can be foreseen poses several important questions. What materials will be employed for fabric coatings? What types and constructions of fabrics lend themselves best to coating? What new methods and equipment will be employed for applying these materials? Who will apply the coatings – the chemical manufacturers, the textile finishers, or companies specializing in fabric coating? The answer to the first of these questions is given in the following article. The answers to the other questions are not yet known. But textile manufacturers and finishers can begin to figure out the answers for themselves and prepare to take full advantage of the opportunities which will be opened up after the war by the large-scale demand for coated fabrics.

Shown at left: Friction-calendering a coated fabric to impart a smooth appearance and hand. On the front cover of this issue is illustrated the method employed for inspecting coated fabrics under illumination of proper daylight quality.

PLASTIC COATINGS

in the Post-War Era

☆ ☆ ☆

By JOHN B. CLEAVELAND
Cleaveland Laboratories & Mfg. Co.

TRANSMUTATION of coal, salt, and water into the beautiful and durable crystal-clear plastics of today is a wonder of which the alchemist of old would not even have dared to dream. Much has been done with plastics; much is being done. But for the future remains the full realization of their tremendous potentialities. It is not too fantastic to see the approach of the plastic age.

Replacement of metals and wood by plastics has been the subject of much research, and millions of words have covered it; but until recently little concerted effort has been put forth to fit plastics into their proper sphere in the textile industry. The suitability of the various plastic materials for fabric coating is determined by their properties when applied to textiles. It is well worth while, therefore, for textile men to acquaint themselves now with the properties of those plastics which seem to give the greatest promise of future importance in the textile field.

The word "plastic" has become the generic name of a vast group of materials with chemical and physical properties ranging from a soft, rubbery substance to a hard, brittle resin; from dull black to crystal clarity; from tackiness to waxy smoothness; from water-sensitiveness to strong acid, alkali, and solvent resistance; from explosive flammability to absolute fireproofness.

The plastic field may be broadly divided into three main classifications: (1) cellulose derivatives, (2) synthetic resins, and (3) synthetic rubbers. In the past, the bulk of fabric-coating materials have fallen in the first two categories. Now, with the impetus of critical wartime requirements, interest seems to be shifting more and more to synthetic rubbers, rubber-like resins, and flexible cellulose derivatives.

Cellulose Derivatives

NITROCELLULOSE. In 1832, an obscure French professor, Henri Bracconot, discovered a reaction between nitric acid, starch, cotton, and wood fibers. Unfortunately, he was not gifted with the commercial foresight so much in evidence in the latter plastic experimenters, and he seemed not to know what

he had discovered or particularly care to conduct a detailed study of the phenomenon. As a result, nothing further was done until the published report in 1846 of the discovery of guncotton by Schönbein. This interested another Frenchman, Jules Pelouze, who had played with the reaction a few years earlier. He conducted a systematic and thorough program of investigation, and gave the name "pyroxylin" to his material. A year later a solution of the nitrocellulose in an ether-alcohol mixture was made by an American, Maynard; and collodion, much used as a Civil War wound covering and the foundation of the pyroxylin lacquers of today, was born.

The first wedding of a plastic and a textile fabric took place in 1885 with the early, halting—but successful—production of artificial leather with pyroxylin. In little more than a generation the artificial leather industry has grown to use almost 50,000,000 yd. of fabric a year. But it is very probable that this will be far from the greatest sphere for coated textiles after the war. Other fabrics coated with nitrocellulose that have gained ready acceptance are waterproof window-shade cloth, hospital and sanitary sheeting, table cloths with decorative and protective finishes, cloth used for making toys, book binding, luggage cloth, awning cloth, and similar materials.

Nitrocellulose is a fluffy material closely resembling the cotton linters from which it is made. It is readily soluble in a variety of solvents, principally in the ester and ketone class. The viscosity of its solutions is easily controlled and it is readily coated by spreader knife, roller, spray gun, or dipping. The properties of the coated cloth vary slightly with the method of application.

Pyroxylin is usually softened and modified with non-drying oils and high-boiling solvents. It is tough and wear-resistant, and withstands moisture, weak mineral acids, and weak alkalis. It is resistant to gasoline, but is slightly attacked by alcohols. It exhibits poor resistance to sunlight and is not particularly suited to any application subject to outside exposure. It does not stand wide variations in temperature. Highly plasticized films have a tendency to remain tacky, and it is common practice to dust them with talc or mica. It has poor resistance to elongation, so that a fabric must be quite heavily coated to withstand rough usage. Nitrocellulose is highly flammable, but this property may be improved slightly by proper plasticizers and modifiers. Its adhesion is very good, and it accepts calendering and embossing well. It releases its solvents easily and quickly, and is odorless, tasteless, and non-toxic. The tear strength of a pyroxylin-coated fabric is generally considerably lower than the untreated cloth. Pyroxylin is a low-priced plastic.

Since it inception nitrocellulose has been the leader in the fabric coating field, but this leadership is being challenged strongly by some of the newer cellulose esters and ethers, as well as some of the synthetic rubbers. If the newer materials are brought down in price after the war to compete with pyroxylin, it is probable that it will be replaced for many purposes.

CELLULOSE ACETATE. The first attempts to produce an ester of cellulose that would not exhibit some of the glaring faults of nitrocellulose occurred with the research of Schitzenberger and Naudin on cellulose acetate from 1856 to 1869. The early material was a completely acetylated type that was soluble only in the toxic chlorinated solvents. In 1905 Miles found that by partly saponifying the completely acetylated cellulose an acetone-soluble product would be obtained. During the first World War large amounts of cellulose acetate solutions were used for airplane wing dopes. With the armistice, the available production capacity was turned to the manufacture of acetate rayon. Finally, in 1927, cellulose acetate was made commercially available for the plastics and coating industries.

Cellulose acetate is a powdery material that is soluble in most ketones and somewhat soluble in esters, but its solutions do not stand as much dilution with non-solvent as does the nitrate. It is not so compatible with resins and plasticizers, and the supply of suitable softening and modifying agents is limited. It exhibits excellent resistance to heat and sunlight, and fair resistance to cold. It is much less flammable than the nitrate; in this respect it has a burning rate similar to uncoated cotton cloth. It is very tough and stands somewhat more elongation before breaking than pyroxylin; however, it does not approach the elongation resistance of the synthetic rubbers. Its resistance to oils and gasoline is good, and its chemical resistance about equal to the nitrate. Its adhesion is only fair, but is generally satisfactory for coating on cotton fabric. Highly plasticized, soft films are spongy and sensitive to water, exhibiting weakness and swelling upon prolonged exposure. Most plasticizers tend to work out of the film, leaving an oily surface. This causes difficulty when the acetate is top-coated, the plasticizer being drawn into the top-coating, thus causing a non-drying, tacky surface. This may be overcome by top-coating only with cellulose acetate or with aceto-butyrate and aceto-proprionate. The heat stability and thermoplastic qualities of cellulose acetate make it particularly suited to heat-sealing adhesive coatings, such as shirt-collar linings. It is also used for fire-retardant coatings, and its clarity and brilliance make it suitable for clear, decorative finishes. It is higher in price than the nitrate and its general incompatibility does not allow it to become a versatile tool in the hands of the chemist.

CELLULOSE ACETO-BUTYRATE AND CELLULOSE ACETO-PROPRIONATE are the most recent esters of cellulose to be produced commercially—the former in 1932, and the latter in 1937. They resemble each other very closely with the aceto-proprionate being slightly more compatible and more thermoplastic. They also resemble cellulose acetate, but their resin and plasticizer compatibility and general solubility approach pyroxylin. They are highly resistant to the destructive action of sunlight and heat. Their moisture resistance and adhesion are improved over the acetate, although their heat-sensitive adhesive properties are not so satisfactory. They exhibit the same plasticizer spewing action, and similar care must be used in top-coating. Their fire-resistance is good. Cellulose aceto-butyrate has slightly less ability than pyroxylin to elongate before breaking, whereas the cellulose aceto-proprionate is better in this respect. Neither of these esters is comparable with cellulose acetate, but both may be combined readily with the nitrate, and many interesting coatings may thus be produced. The full-bodied, deep gloss of their films is pleasing. More work will undoubtedly be done with these materials after the war to fit them into the textile field.

ETHYLCELLULOSE is by far the most important of the ethers. A British patent granted to Lilienfeld in 1912 describes the preparation of an ethylated cellulose. Many of its properties and potentialities were recognized at this time, and considerable development work followed. After the last war, a limited production was carried on in Germany, and some of the ethyl cellulose was imported into this country,

Upholstery fabric coated with synthetic resin is stain- and dirt-resistant and resists wear better than an uncoated fabric.

along with methyl and benzyl cellulose. Commercial production was started in this country in 1935. Its growth has been steady, and formulators, appreciating its versatility, recognize it as a coating with a very bright future indeed.

Ethyl cellulose far surpasses other cellulose derivatives in a number of important properties. Among the most important of these from the standpoint of textile utilization are its toughness and flexibility over wide variations of temperature. These coupled with its fireproofness and sunlight and heat stability have led to its acceptance by the armed forces on such a scale that the demand exceeds even its greatly expanded wartime production. It is notable that it is useful for many purposes in temperatures as low as –80°F.

The compatibility of ethyl cellulose with resins, waxes, oils, and plasticizers is of such a high order that many interesting modifications are possible in which the coating composition partakes of some of the properties of each of its constituents. Blends of ethyl cellulose and waxes, as an example, exhibit a water repellence approaching that of the wax and still retain much of the film strength of the cellulose ester.

It has excellent resistance to alkalis, but is no better than other cellulose derivatives in its resistance to acids. Alcohol is a partial solvent for it, and only certain types will withstand gasoline. It has excellent heat-sealing ability and is much used for thermoplastic adhesives. In this regard it seals at a lower temperature than cellulose acetate, but is not so permanent. Ethyl cellulose has a very low specific gravity. Films of equal thickness and bulk to those of pyroxylin weigh only about two-thirds as much. This is of value where weight of coating is a factor. It also increases the spread of a coating to the extent that the higher-priced ethyl cellulose can frequently compete against pyroxylin.

It calenders to a high gloss, particularly when lubricated slightly with waxes. This fact, plus its alkali resistance and excellent elongation, has made it satisfactory for use as a permanent glazed-chintz finish. It also embosses well and is used for some types of artificial leather. In general, it can be employed wherever nitrocellulose is used, frequently with an improved result, and at a price that is almost but not quite so low.

Its low melting point allows it to be used in the interesting new hot-melt coatings where the solution is applied at a temperature above the melting point of the mass and with little or no additional solvent. It also may be applied by calender coating or any of the more conventional means. It mixes completely with nitrocellulose with an improvement over the properties of the straight nitrate. It also mixes and modifies many oil varnishes to produce quicker drying, tougher and more durable finishes.

Synthetic Resins

PHENOLIC RESINS. The birth of the great synthetic resin industry occurred in 1909 with the discovery by Dr. Leo Baekeland of a heat-hardening resin condensate of phenol and formaldehyde. The first resin was thermosetting and was noted for its excellent toughness and high electrical resistance. It found ready acceptance in the electrical field, particularly for radio parts; and, when its mechanical strength was recognized, it was used as a laminating adhesive for fabric or paper for the production of fiber gears.

It was not, however, readily compatible with oils and plasticizers and, therefore, was not generally suitable for fabric coatings of even moderate flexibility. Chemists soon solved this problem by producing oil-soluble thermosetting and thermoplastic resins. These resins, especially the thermoplastic type, allowed the formulation of quick-curing, relatively flexible varnishes suitable for many types of cloth coatings. Perhaps the most representative of these are the varnished cambric used for electrical insulation and the

oil silk of pre-war days that was used for many waterproof cloth requirements. These coatings may be made very resistant to solvents and chemicals, particularly acids, although they are affected by alkalis. It should be noted that the phenolics are used generally, if not entirely, in a modified form, with oils or other resins as modifiers. It is in this form that they will probably continue to be most useful.

ALKYD RESINS. While research was progressing on phenolics with the molding field principally in mind, another group, the alkyd resins, were produced to overcome the unreliability of the natural resins in pyroxylin lacquers and quick-drying varnishes. The reaction between the polybasic acid, phthalic anhydride, and the polyhydric alcohol, glycerine, was known as early as 1901. However, due to the high cost of raw materials, it was not until the production of a relatively low-cost phthalic anhydride in 1918 that such a resin was commercially feasible. After intensive research, an alkyd resin was put on the market in 1926, and was soon followed in the field by others.

The first alkyds were used principally with nitrocellulose, producing full-bodied lacquers with good adhesion and excellent sunlight resistance. They were, however, notably weak in moisture resistance. As research continued these failings were to a great extent overcome. Chemists discovered how to modify pure alkyds with oils. The resulting resins would not only weather well, but also they added a flexibility and toughness to the lacquer that had not previously been possible. It was found that an oxidizing type of resin could be produced which was suitable as the major film-forming material in the coating. These coating materials were found to have excellent color, flexibility, and durability, and fair chemical resistance. They were used to produce electrical-insulating cambric and now are employed in producing gas-resistant fabrics useful in chemical warfare. The alkyds are finding an ever-increasing field of usefulness in lacquer and varnish finishes. In fabric coatings their use seems to be increasing as a modifier and plasticizer for other resins and various cellulose derivatives.

UREA FORMALDEHYDE RESINS. The development of urea formaldehyde resins was started in 1920 with the idea first of producing a synthetic glass and then of obtaining a hard, durable compression-molding material. In the 1930's it was discovered that the addition of alkyd resins would produce a flexible, usable finish with interesting possibilities. Since the urea resins hardened by polymerization, rather than by oxidation as in the case of the alkyds, or by evaporation of solvents as in lacquers, it was found that catalysts could be added to the solution, thus forming low-bake finishes of unusual hardness and abrasion resistance. The flexibility of these coatings has been much improved, and they seem to offer possibilities as waterproof cloth coatings of the oil-silk type for use after the war. At present such coatings are used to weatherproof and fireproof duck, as well as to produce waterproof and gas-proof fabrics. Emulsions of these resins are used in producing crush-resistant fabrics. An intermediate form of these resins is water soluble. Large quantities are used in the adhesive field, but they offer interesting properties that may be utilized in the future for the processing of fabric.

MELAMINE RESINS are another development of the amine-aldehyde reaction. Their properties and possibilities are quite similar to those of urea-formaldehyde. They are similarly thermosetting, bake at a slightly lower temperature, and offer slightly better resistance, although—as with urea resins—both strong acids and strong alkalis will decompose them. Their uses and future follow the urea formaldehyde type.

As is evident from the foregoing, most of the synthetic resins are used with drying oils for fabric coating. Those used with pyroxylin are only modifying agents that do not materially or fundamentally alter the properties of pyroxylin itself. The oil-modified resins are applied to fabric almost exclusively by the dip method. The resulting coating must oxidize to dry. This process is continuous over the life of the fabric and, if improperly formulated, there is some danger of spontaneous combustion. There is also a tendency for the cloth to become more and more brittle as oxidation progresses. Resins which dry by polymerization, such as the urea and melamine type, are free from this effect.

Other types of synthetic resins do not lend themselves to fabric coating, or are in an experimental stage.

Synthetic Rubbers

The war program has thrown the spotlight on the use of synthetic rubbers on fabrics. Formulating and handling experience that would ordinarily span years has been crammed into a few months. However, this has only meant the acceleration of a development that was clearly foreshadowed. The types of synthetic rubbers that seem most suitable for fabric coating are resinous and are sometimes classified as synthetic resins. In this discussion they are referred to as synthetic rubbers, because of their ability to produce a coating with an elasticity approaching that of natural rubber.

Vinyl resins were prepared over a century ago by Regnault, but have been commercially available in this country only since 1928. In that year the first of the extensive line of Vinylite resins was introduced. The use to which these resins, together with polyvinyl acetal, formal, and butyral, has been put has freed thousands of tons of natural rubber for more critical requirements. In many instances the resulting products have proven superior to their rubber counterparts. It is a general belief that vinyl-treated fabrics look forward to a future of unlimited proportions. The polyvinyl resin field is a broad one, and the chemist has at his command materials suitable for many requirements.

POLYVINYL ACETATES are very thermoplastic, easily soluble in an extensive range of solvents, and compatible with many other resins and with nitrocellulose. They make excellent bonding resins and adhesives suitable for many surfaces. Formulas in which they are an integral part have good resistance to ultraviolet light and outdoor weathering. They are soft and quite plastic and will tolerate little plasticizer before their films are permanently tacky. Their chemical resistance is fair, but does not compare with other vinyl resins. Their films are quite subject to cold flow and lack strength; therefore, except in the case of adhesives, they are generally used as a modifying agent for other film-forming substances.

POLYVINYL CHLORIDE lies at the other end of the scale of properties exhibited by this class of synthetic rubber resins. It has exceptional chemical resistance, withstanding exposure to both strong acids and strong alkalis. It shows complete resistance to gasoline and good resistance to almost all solvents except certain of the higher ketones. Its film is but very slightly thermoplastic and readily stands a temperature of 250° F.

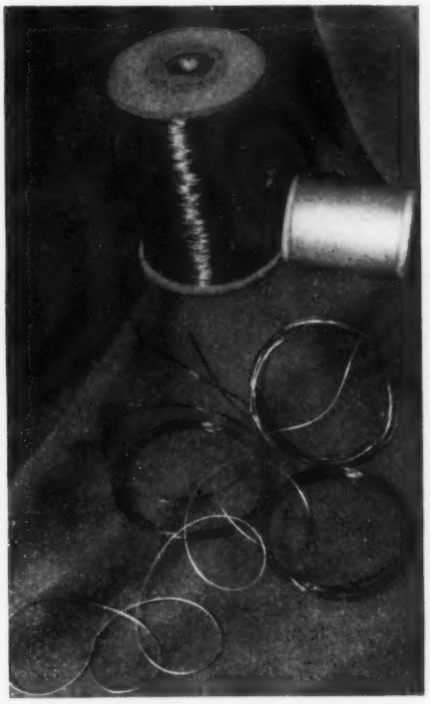
without blocking, as well as better than 40° below zero without cracking. It is very tough, strong, and rubbery, and has one of the highest elongation and abrasion resistances of the synthetic coating materials. As a coating material its adhesion is not good, and it is difficult to handle because of its relative insolubility. It seems practical to apply it to fabric only by calender.

VINYL CHLORIDE-ACETATE COPOLYMERS. Perhaps the polyvinyl resins that are best adapted to general coating procedures are those obtained from the copolymerization of vinyl chloride and vinyl acetate. They exhibit properties akin to both the acetates and the chlorides. They have a sufficient solubility in most ketones and may be readily plasticized to any degree of flexibility by the aid of easily obtainable plasticizers. The resins are colorless, tasteless, odorless, and will not support combustion. Completely fireproof films may be produced by using proper modifiers. The copolymer films have a very high degree of flexural strength and abrasion resistance. They are unaffected by mineral acids, alkalis, gasoline, alcohol, and water. They have suitable adhesion to most fabrics, particularly when subjected to heat upon drying. They are somewhat more thermoplastic than the chloride, but will withstand temperatures up to 180° to 200° F. without blocking and will withstand 40° F. below zero without cracking. Unlike natural rubber, they show a very high resistance to oxidation in an oxygen bomb, and have much superior weathering ability.

POLYVINYL BUTYRAL RESINS were developed first and used extensively in peace time to cement sheets of glass to form the safety glass used in automobiles. Their films have exceptional strength. This property was popularly demonstrated by shooting a cannon ball of Civil War vintage at a heavy film of butyral. The ball would sink deeply into the film, but would not break it, and the film would gradually assume its original size and shape.

In searching for a wartime substitute for the critical rubber and the but slightly less critical polyvinyl chloride and copolymer resins, chemists investigated the possibilities of the butyral for many purposes with excellent results. One interesting property of polyvinyl butyral is that it may be vulcanized either chemically or by heat. Before vulcanization it is easily soluble in alcohol, although it is quite resistant to the solvent action of acetone and like solvents. It is quite water sensitive, and is readily attacked by acids. Its resistance to alkalis is fair. In general, it is not particularly satisfactory for any use subject to corrosive elements. Its adhesion is very good, and waterproof seams may be made simply by wetting the coated fabric with alcohol and using pressure. After vulcanization, its chemical resistance is tremendously improved. The resin becomes insoluble in practically all solvents. Its resistance to water becomes excellent and its resistance to acids and alkalis good. After vulcanization, it is not so compatible with plasticizers as other vinyl resins and does not produce so soft and pliable a film.

It is quite an expensive coating material and its utilization may be limited for that reason.



Ethylcellulose extruded over a base of cotton yarn or thread retains the strength of the cotton and adds the color and brilliance of a plastic.

POYLVINYL ACETAL AND FORMAL are closely akin chemically to polyvinyl butyral and have similar properties, both chemical and physical. They may be applied by any of the common procedures.

ACRYLATE AND METHACRYLATE RESINS offer many important properties that have as yet not been thoroughly investigated. The acrylates were first commercially produced in this country in 1931 and their value for fabric finishing was soon noted. The methacrylate resins were introduced in 1936. Use of the acrylates and methacrylates, principally in emulsion form, as fabric sizes and softeners, has been greatly accented. Their use as fabric-coating agents has not been so completely studied, and the future holds many interesting possibilities for these resins. They may be used alone, where they produce a film of great softness and elasticity; or they may be used as modifying agents for other film-forming materials, such as vinyl resins, pyroxylin, cellulose acetate, and other cellulose derivatives. As modifying agents they contribute many of their valuable properties to the mixture, such as flexibility and adhesion. They make excellent adhesives and are used to replace rubber cements for many applications, such as seam cements for waterproof garments. They also produce good heat-sensitive cloth coatings suitable for collar linings and similar uses. At the present stage of development the acrylate resins seem to offer the more interesting properties for fabric coating, although the methacrylate resins are suitable for many applications. Use of the acrylate types is somewhat limited by their high price.

THIOKOL AND NEOPRENE. There are many other types of synthetic rubbers which offer a potential future for specialty fabric coatings. Thiokol is used for coating gasoline-resistant fabric box liners as a replacement for metal cans. Neoprene coated fabric is used for many solvent-resistant purposes. Most of these types of synthetic rubbers, however, are very dark in color and have a particularly disagreeable odor. Without question they will take their rightful place as coating materials when they become available.

CHLORINATED RUBBER. The future of natural rubber and consequently of derivatives of natural rubber is uncertain. There will undoubtedly be a very considerable time lag after the war is over before sufficient rubber latex is harvested and shipped to more than supply the country's barest essential needs. Nevertheless, some of the coating materials offer properties of such importance that they will continue to be necessary for some purposes; and when rubber is again plentiful, many new and valuable uses will be found.

Chlorinated rubber, introduced in this country quite recently, is not a new

development. It was first produced in England in 1859 and commercial production was begun in Germany in 1917. It does not resemble its parent, rubber, but is an entirely new material with new physical and chemical properties. It is readily soluble in aromatic hydrocarbons, such as toluol, producing solutions with excellent viscosity characteristics not subject to gel as is evident in solutions of pure rubber. It is also soluble in most esters and ketones, but insoluble in gasoline, turpentine, and alcohols. It is compatible with most animal and vegetable oils and most alkyd, phenol, and natural resins. For this reason, it is much used to fortify and improve the drying characteristics of varnishes. Outstanding properties of chlorinated rubber are its resistance to corrosive chemicals, water, and fire. It was used in huge quantities at the start of the war to fireproof and waterproof canvas tent material, and the substitutes that have, of necessity, replaced this very critical substance fall considerably short of equalling its properties. It has exceptional resistance to water, strong acids, alkalis, and salts. Its adhesion is good and its flexibility is adequate, although in this respect it does not approach natural or synthetic rubber, vinyl resins, or acrylate resins. It has poor resistance to sunlight, and the effects of heat, and is not satisfactory for use where these elements are present.

* * * *

Use of plastics by the textile industry is so comparatively new that their full value is difficult to evaluate. Certain it is that the day of the coated fabric that is heavy and stiff, or spongy and tacky is past. In its place will be a fabric that is as soft and pliable after coating as before. The coating will add but little weight to the textile and still it will be able to stand a great deal of handling before its waterproofness is impaired. It will have good chemical resistance, and will stand many washings and dry cleanings before breaking down. It will add much to the wear of the fabric, particularly in regard to its abrasion resistance and its ability to withstand continued folding without tearing. It will have a full body and a brilliant gloss, or it will be so dull and light in weight as to be almost impossible to distinguish from an uncoated piece. It will be possible to coat the fibers of the fabric and allow the continued passage of air through the interstices and still retain a satisfactory waterproof rating and other desirable resistant characteristics of coated fabrics. The price will be low so that it will be available for quantity production articles.

These properties and many others are easily envisioned in the coated textile of the not-too-distant future. We may confidently look forward to the combination of plastics and textiles taking an active and important part in the tremendous betterment of living standards that will follow when peace once more graces the earth.

[Methods for coating fabrics with polyvinyl resins were described in an article by Mr. Cleaveland in the December, 1942, issue of Textile World—*Editor.*]

Properties of plastic coating materials when applied to textiles.

	Solubility	*Compatibility*	*Water Resistance*	*Acid Resistance*	*Alkali Resistance*	*Alcohol Resistance*	*Gasoline Resistance*	*Flammability Resistance*	*Heat Resistance*	*Cold Resistance*	*Sunlight Resistance*	*Tack Resistance*	*Flexibility*	*Adhesion*	*Heat-Sealing ability*	*Abrasion Resistance*	*Color*	*Odor*	*Price Range*	*% Yield-Film thickness same Pyroxylin = 100*
Pyroxylin	E	E	G	F	F	P	G	P	F	F	F	F	F	E	F	F	G	O	L	100
Cellulose Acetate	F	F	F	F	F	P	G	G	E	F	E	G	F	F	G	F	E	O	M	122
Cellulose Aceto-butyrate	G	G	G	F	F	P	G	G	E	F	E	G	P	G	F	F	G	O	M	136
Cellulose Aceto-proprionate	G	G	G	F	F	P	G	G	E	F	E	G	G	G	G	F	G	O	M	133
Ethyl Cellulose	E	E	E	F	E	P	F	G	E	E	E	G	G	G	G	F	G	O	M	145
Phenolics (general)	G	G	E	E	P	G	F	G	G	P	P	F	F	G	P	B	P	B	L	.....
Alkyds (general)	G	G	F	F	F	F	G	G	G	F	G	F	G	G	P	F	G	O	L	.....
Urea-aldehyde (general)	F	F	F	F	F	G	G	G	G	F	G	G	F	F	P	G	G	O	L	.....
Melamine	F	F	F	F	F	G	G	G	G	F	G	G	F	F	P	G	G	O	L	.....
Vinyl Acetate	E	G	G	G	G	G	E	G	F	F	G	F	G	G	E	F	G	O	M	140
Vinyl Chloride	P	P	E	E	E	E	E	G	G	E	G	E	E	P	P	E	G	O	M	118
Vinyl Chloride-Acetate	F	F	E	E	E	E	E	G	F	G	F	G	E	F	G	G	G	O	M	123
Vinyl Butyral	F	F	G(1)	G(1)	G(1)	F(1)	G)1)	G	G(1)	G	G	G	G	G	G	G	G	O	H	151
Vinyl Acetals	E	F	G(1)	G(1)	G(1)	F(1)	G(1)	G	G	G	G	G	G	G	G	G	G	O	M	147
Acrylates (general)	G	G	G	G	G	G(2)	G	G	G	G	E	F	G	E	G	F	E	S	H	150
Methacrylates (general)	G	G	G	G	G	G(2)	G(2)	G	E	G	E	F	G	E	G	F	E	S	M	158
Chlorinated Rubber	G	F	E	E	E	E	G	E	P	P	P	G	F	G	G	G	G	O	M	101

(1) = After vulcanization; E = excellent; G = good; F = fair; P = poor; O = none; S = slight; B = bad; (2) = Some types soluble; L = Low; M = Medium; H = High.

Manpower Moves Help in Textiles

Particularly beneficial is order making production of civilian goods essential

WASHINGTON, D. C.

THREE RECENT major war-agency orders are giving important manpower assistance to the textile industry: the President's hold-the-line order on wages and prices; the War Manpower Commission's order freezing labor to its jobs; and the revised definition of essential activities and occupations issued by WMC, in cooperation with Selective Service, which includes, production of civilian as well as military yarns and fabrics.

Any appraiser of these aids to the industry should make haste to add, however, that the first two, the President's wage-price order, and WMC's job freeze, are good *while they last*. These orders are not wholly explicit; they are not readily enforceable; they are full of snipers' loop-holes; and great pressures are already bearing against them. The fight against inflation is at best a rear-guard action.

Most important and most promising, apparently, is WMC's order, issued in conjunction with Selective Service's now-famous Bulletin No. 20, placing production of civilian yarn and cloth on a par with military production as essential employment.

In addition to making civilian goods an essential product, the WMC order also puts it in the class of essential activity with reference to selective service regulations, governing deferments. The order lists textile industrial processes, products, fibers, and occupations, in both civilian and military categories, that come within its scope. Luxury goods are omitted, however, from the commission's ruling.

Frank L. Walton, director of the Textile Division of WPB, said in regard to the new definition of essential production, ". . . the way is now clear for uninterrupted maximum production of essential yarns and fabrics for military and essential civilian use." This action, he stated, provides much-needed stabilization of employment in yarn and fabrics. It means that 1,000,000 workers in textiles are subject to Regulation No. 4 of WMC, which is the order freezing labor to its jobs. Mr. Walton added that occupations in production of cordage, rope and twine for packaging also are now classified as essential under WMC's bulletin No. 27.

The new definition of textile production defines the area in which WMC's Regulation No. 4 affects textile employees. This means that, since workers in the specified types of production are now classed as essential, they cannot move on to other essential jobs at higher wages unless they are authorized to do so by the terms of employment stabilization programs.

The definition order, Mr. Walton said, leaves it up to the individual mill, first to determine the capacity production potential of its machinery, and second to do all it can to attain this maximum. He emphasized that the order applies to woolen, worsted, rayon and cotton yarn and fabric mills. Yarn is the major bottleneck facing all fabric mills, he said; WPB is prepared to assist in every way possible, and producers of all yarns are urged to work more shifts and longer hours if possible.

REFERRING BACK to the three major orders affecting textiles, the latter two, as already stated, may not be of permanent value. To consider first the President's wage order, it is under strong attack by organized labor and by the Congressional farm bloc. Both labor and the farmers think that prices are outrunning their incomes. The President, exhorting all agencies to back him, is attempting to freeze the existing delicate balance—to hold the line. The Administration is favorable to letting both workers and farmers have a greater dollar take-home, without benefit of increased prices, by means of incentive pay plans for labor and subsidies for farmers.

Temporarily at least, the anti-inflation dike is holding, though leaking. The War Labor Board has disallowed wage increases, setting a precedent which may throw out some 10,000 pending cases. Both AFL and CIO voice approval of the executive order, but CIO objects to its provision against increases to correct inequalities. Labor says it will stick by the Little Steel formula only if prices do not rise, and producers can hold the price line only if wages do not rise.

The order excepts incentive payments and WPB is strong for them. Such payments can be added to workers' dollar take-home without formally increasing their wages, while at the same time reducing the cost of production. In so far as such means can curtail inflation, they reduce the cost of the war, holding up the value of dollars. But of course incentive pay poses some problems: administration would be complicated, and it would not increase production where parts and materials are the limiting factors.

WMC's job-freeze order, which puts into effect a clause in the President's hold-the-line order, forbids workers in essential industry to go to other jobs for higher pay. WMC has already established local stabilization areas. These areas are not much affected by the order; job shifts are permitted within them and the order merely puts statutory penalties behind area programs: a year in jail or $1,000 fine, applicable to both employer and employee.

Outside these areas, the order permits any one to leave a non-essential job, but a man who has been working in a designated essential industry during the preceding 30 days cannot take another job for higher pay. A man who can prove he is working below his highest skill, or who has been discharged or laid off seven days, can demand of his employer a "statement of availability" which will exempt him from the order. But this order obviously leaves the way open to raiding by promise of more overtime, bonuses in low rent, transportation charges, etc. And, if a worker claims he has been unemployed for the last 30 days, there is no way his new employer can check up—particularly if he doesn't want to.

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Employee-Morale Boosters

Using the Plant Organ

Several mills are using their plant organs in the fight against absenteeism. *The Beaumont E*, published by and for the employees of Beaumont Mfg. Co., Spartanburg, S. C., devoted a recent issue almost entirely to this subject. Its front cover consisted entirely of: "A?" —the A being for absenteeism, of course. A powerful argument used was the running of a large number of pictures of Beaumont employees now on the battle lines, with the question as to how it would be possible to explain "unnecessary absences to these men on such necessary absences."

Arlington Mills *News and Views*, published by Arlington Mills, Lawrence, Mass., devoted the inside front cover of a recent issue to an article by J. Sime Mercer, agent, giving the absentee report for February and pointing out that during that month "the Arlington Mills worked 6.1% of the time for the Axis!" That was the absenteeism percentage for the total mill for February. Mr. Mercer did not mince words. "There should be a name for the worker who refuses to work," he stated. He invited a better showing in the future by concluding with this statement: "I should like very much, a little later, to print another set of figures showing a big improvement!"

"Family Night" Parties Held at Plant

More than 4,500 people, including employees with their families and friends, visited the series of nine "Family Night" open-house parties recently concluded at the Marcus Hook, Pa., plant of American Viscose Corp. The programs, held in the plant gymnasium, included a large number of exhibits showing actual samples of parachutes and other war equipment containing rayon, and a stage show put on by employees. The central attraction was a large diorama depicting an invasion scene on a South Pacific island, featuring rayon cargo chutes, and planes with rayon cord tires and rayon-and-rubber self-sealing gasoline tanks. This battle scene, faithfully reproduced by employees from actual photographs, was activated by gun fire, bomb explosions, and realistic sound effects. Music, refreshments, dancing, and an opportunity to tour the plant rounded out each program.

R. S. V. P.

Q.—What is more important than boosting morale in textile plants producing yarns, fabrics and knitgoods for military and essential industrial and civilian uses?

A.—Nothing.

In that conviction, we present here a group of "shorts" on how other companies and other men are boosting morale.

This is a further step in TEXTILE WORLD's 1943 campaign for sound personnel policies attuned to the need of a nation at war. Previous steps in this campaign included "An Employee's Handbook" in our February issue; the series of articles on "Utilizing Manpower and Womanpower" in our March issue; and the series on "Absenteeism" in our April issue.

We plan to continue this campaign throughout the year. We invite your contributions. Let us know what you and your company are doing to reduce absenteeism and to boost morale.

R. S. V. P.

—Editor

Day's Work For Red Cross

One hundred and ten workers of the Atlanta (Ga.) Hosiery Mills have worked a full Saturday at overtime rates which they contributed to the War Fund of the American Red Cross.

Workers Mirrored in Plant War Slogan

To emphasize the meaning of its slogan—"V" Depends On Me!—Leeds & Northrup Co., Philadelphia manufacturers of electrical measuring instruments and heat-treating furnaces, displayed mirror posters on the bulletin boards of the plant.

Standing before the red, white and blue poster, one employee after another saw his or her face in the mirror above the slogan "V" Depends On Me! The mirror attracted and the true meaning of the slogan registered.

Fighting Spirit of G.E. Woman War Worker

Our nation's war industries need more women workers with the fighting spirit of Louise Chambers. Louise works in the GE war plant in Cleveland, Ohio. She has a father in the Merchant Marine, an Uncle Bob with the U. S. Marines in Panama, an Uncle Ed who was killed in action with the Marines in the Pacific, and three brothers in the Navy. She lost her mother several years ago.

Louise has the same flame of patriotism and sense of duty as the rest of her family and she entered war work last February. She went through high school and would have liked to become an artist or dress designer, but had to earn her living consecutively as a waitress, governess, clerk, and sign painter. When she came with GE she wanted assurance

All the men in the Chambers family are in the services; Louise makes war materials at G.E. One of her fighting brothers, on furlough, looks on.

RUSSELL MFG. CO., Alexander City, Ala., has recently erected a refrigerated locker plant for the benefit of its employees as well as other citizens of the community. Ben C. Russell, president, desired to stimulate food production on the part of his employees. The locker plant offers them a place where they may have their pork and beef processed, frozen and stored until needed. Heretofore employees once or twice a year asked "for a few days off to kill hogs." This is no longer necessary as the locker plant is available and does a better job of it. Vegetables are also handled for employees and the plant provides a market place where persons who have a surplus may dispose of it. In photo above S. H. Bradshaw, Jr., an official of Russell Mfg. Co., points out the roominess of a locker to Haygood Patterson, Alabama commissioner of agriculture and Eric Alsobrook, locker plant specialist with the Department of Agriculture.

of promotion and permanency after the war is won.

Louise recently had her brother "Bill" for company who was home on furlough from his combat zone with the Navy in the Pacific. "Bill" went up to the plant to watch his sister at work. Although he was very "close-mouthed" about his experiences in the Navy, he was amazed and proud of the work Louise was doing.

For Supervisors And Foremen

THE FOREMAN'S HANDBOOK: Edited by Carl Heyel, 1st Edition, 1943, McGraw-Hill Book Co., Inc. New York; $3.

A complete and useful manual, written in understandable language, that should broaden the outlook of foremen who want to understand the factors which influence their jobs and to prepare for larger responsibilities. Eighteen specialists assisted the editor in the preparation of this handbook on all phases of foremanship, from handling people to laying the groundwork for study of economic factors and management fundamentals.

Chapters entitled Special Problems in Supervising Women, The Tools of Industrial Psychology, Job Evaluation, and Merit Rating of Employees, are timely, and give the ambitious supervisor a background for the better understanding of new developments that are coming up from day to day in management and supervision of textile plants.

Knitters Have Attendance Award

Munsingwear, Inc., Minneapolis, Minn., puts names of those employees with perfect attendance records in a barrel each week from which "lucky numbers" are drawn for prizes.

Accident Reduction Drive Among Women

Apex Hosiery Mills, Philadelphia, has established the first local branch of the Women's Industrial Protection Services in a drive to reduce industrial accidents among women employees. F. Elwood Struve, general manager of Apex, and William M. Leader, chief of the local hosiery union, issued a joint statement disclosing the Apex was cooperating with the safety campaign of the War Production Fund to Conserve Manpower.

Ruth Hussey Visits Rayon Plant

The Women in Production Service (WIPS) made Ruth Hussey, Metro-Goldwyn-Mayer star, an honorary major in their corps when she visited the Spruance rayon plant of E. I. du Pont de Nemours & Co. at Ampthill, Va. In a brief ceremony, G. E. McClellan, plant manager, and Mrs. Evelyn Richmond, chairman of the central committee, awarded Miss Hussey the insignia of a major. Miss Hussey then visited the plant where she talked with the WIPS about their work and the new WIPS organization. The idea of the WIPS was originated by the Spruance War Production Committee for the purpose of giving recognition to the women of the industry, who feel the responsibility of their role as "home front soldiers". As the women workers advance in rank in the WIPS they will be awarded varicolored bars signifying outstanding records in attendance, safety suggestions, civilian defense activities, and other phases of war service.

Women workers who comprise 30% of the personnel, have shown their interest in this organization by a drop in their absentee rate and increase of 40% in suggestions contributed.

VACATIONS HELP PRODUCTION

"I BELIEVE," states Donald M. Nelson, chairman of WPB, "that the granting of vacations to industrial workers this year will be helpful to war production. Experience has shown that the volume of production is increased if the workers can restore their energies through periods of physical and mental rest, change and relaxation. After a brief vacation a worker should be in better shape to contribute to the increased effort which our war program makes necessary. Management and labor can and should plan the release of workers for vacations by working ahead in some departments, by arranging for staggered vacation schedules, by training substitutes and, where necessary, by working additional overtime. There must be no shutdown of any department of a war production plant if that would curtail production. The wartime vacation will probably be briefer than usual; it should involve little or no travel, and where possible it should be used for the performance of such duties as otherwise would require the worker to take time off during a regular work week."

The Accident-Prone Employee

Can be weeded out by simple tests; fatigue is serious enemy of safety

By A. WYN WILLIAMS

JUST AS A TYPHOID CARRIER is a menace in a kitchen, through no fault of his own, so certain persons, because of congenital peculiarities are menaces to themselves and to their fellow workers in industrial plants employing high-speed machinery. It is no reflection on their diligence or their moral character; they are the misfits of a machine age and just happened to have been born that way.

In any industrial plant where the employees are hired without any inquiry as to their adaptability to operate modern, high-speed machinery, about 25% of the workers have an inherent proneness toward accidents. These accident-prone employees will not only get hurt twice as often in the course of a year as the other 75% of the workers, but they will also continue during their industrial life to have an excessive proneness to accidents, regardless of any attempts to teach them safe practices.

Fatigue is another serious enemy of safety. Inexperience and youthfulness are still other causes of accidents. These facts have been disclosed by scientific investigations carried out by the Government in Great Britain to discover what steps can be taken to reduce the heavy inroads accidents are making on war output.

Proneness to accidents has been found to be directly related to the degree of muscular coordination developed by the subject. The British Government tested some 16,000 workers from a cross-section of industry, comprising employees in manufacturing plants, dock workers, air-craftsmen, railroad workers, etc. These workers were subjected to what are called "Esthetokinetic tests." These tests show the manner in which nervous impulses received through the medium of some specific sense organ are interpreted by the subject as a sign for varying muscular performance. They make it possible to detect the accident-prone worker before he is hired and put on a hazardous job.

There are some fifteen such tests, and the subject is graded according to both the speed and accuracy of his responses. A minimum of equipment is required and the nature of the tests is so simple that the training of someone in the personnel department to apply them will be amply repaid by the reduced number of accidents that will occur by disclosing whether or not applicants for, or workers on, hazardous jobs have a proneness for accidents. The nature of some of these tests is indicated by the following few examples.

To measure the coordination of eye and hand, the subject is asked to dot a series of small circles on a disk revolving at increasing speeds. The ability to choose the proper reaction to visual, auditory, or tactual stimuli is measured by asking the subject to place his finger on one of three buttons corresponding to the particular stimulus. The finger always starts from the same position and has to travel the same distance for all responses. The degree of coordination is measured both by the accuracy in designating the particular stimulus as well as by the speed of the response measured in hundredths of a second.

ANOTHER TEST is called the interrupted pursuit test. Visual stimuli in the form of a red or white disk are likely to appear at the same time an auditory stimulus in the form of a bell or a buzzer occurs. The subject must register correctly the particular stimulus by pressing the appropriate button if it is a visual stimulus or depressing a treadle if the stimulus is auditory, using the right foot to signify that the stimulus is is the buzzer and the left for the bell.

A subject's muscular steadiness is tested by his ability to keep a ball at the end of a stylus from touching the inside of a metal cup which is moved about in an irregular way. A buzzer sounds if the ball touches the sides, and the length of time it takes a subject to break contact is recorded. Still another test is to make the subject grip a Salter's dynanometer with each hand in succession, the sum of the two grips being expressed in kilograms.

After the responses of the workers to the various tests had been recorded, their case histories of accidents were examined. It was found that the 25% with the poorest reaction to the tests had an average history of 0.73 accident per man per year, whereas the average of the remainder 75% was only 0.37 per man per year, or roughly one-half the number.

INTELLIGENCE TESTS. When esthetokinetic tests are combined with simple intelligence tests, a still further selectivity can be achieved. The 25% of workers with the poorest record in both esthetokinetic tests and intelligence tests combined had an average of 0.88 accident per year per man. That is, the 25% of workers who have the poorest record for intelligenge, as well as for muscular coordination, suffer 2½ times as many accidents as the 75% with the better grading. As more is learned about the personal factor in accidents, it is possible, of course, that the 75% with the better records can be subjected to a further winnowing process.

Until such tests are generally adopted, plant management is at a disadvantage in trying to eliminate from applicants with no previous industrial experience, those with a proneness to accidents. With the older workers, some guide can be secured if they will, when interviewed, give a truthful account of their previous accident record.

It has been definitely proved that workers frequently involved in accidents in the past will not only be more liable to accidents in the future, but also they will be the ones generally involved in the more serious accidents. With the stringency of manpower in the production program of a total war, it may be impossible not to hire accident-prone workers. In such instances, they can be assigned to the least hazardous jobs in the plant, especially to those not involving the operation of high-speed machinery.

FATIGUE. Outside the fact that certain persons are congenitally prone to suffer accidents, the chief lesson learned about the personal factor affecting accident frequency is that fatigue is the worst enemy of safety. This is a natural corollary of the discovery that inability to coordinate properly is the besetting characteristic of the accident-prone.

When even the naturally safe worker is unduly tired, his muscular reactions become temporarily sub-standard and he falls into the same class as the accident-prone.

In World War I it was found that accidents to women were 2½ times as numerous when they worked on a 12-hr. shift as when on a 10-hr. shift. Therefore, in this war, because of this as well as other efficiency considerations, the Government in Great Britain has laid down the principle that weekly working hours, even with overtime, should not exceed 60 to 65 for men and 55 to 60 for women. Actually, except in the case of emergency jobs, the weekly hours in Britain now average about 54, with a still shorter week in the heavier industries.

The accident-prone employee not only suffers twice as many accidents as the worker who is not accident-prone, but usually is involved in the more serious ones.

Physical fatigue on a job may, of course, result from other causes than length of hours worked. Monotony of repetitious work, defective lighting, or inadequate supply of fresh air, etc., also pay their part in overtiredness. Anything management can do to eliminate physical fatigue will be amply repaid by a reduction in accidents. If excessively long hours have to be worked, additional rest periods are recommended to break up the protracted character of the operation.

INEXPERIENCE AND YOUTHFULNESS. There is a still further personal factor which adds to the problems of war time management, forced to take on an undue proportion of new help. Inexperience is a fruitful cause of accidents among all classes of workers, and, unfortunately, inexperienced women and youths, from which two classes new help is likely to be chiefly recruited in the future, are twice as prone to suffer accidents in the initial period of their acquaintance with industrial processes as inexperienced matured males.

After they have become used to their work, new women workers who are not naturally accident-prone do not have a higher ratio of injuries than males doing the same work, except for scalp wounds. Apparently a woman's vanity about her hair will not succumb to the demands of safety, and she will neither cover it up properly nor adopt a sane and safe method of doing it up.

Inexperienced young men constitute a more serious accident problem than do inexperienced young women. Contrary to what would be popularly supposed, young persons in industry are a special hazard. Although their individual faculties, taken one by one, are keener, their ability to coordinate them until about the age of 23 is much poorer than that of the older person. Therefore, youths under 23 suffer more accidents than any other age group, and nothing can be done about it except to wait for them to grow up. Close supervision of the inexperienced young woman for the first few weeks of her employment and not putting her on operations involving high-speed machinery will quickly remove her from the accident-problem class, but inexperienced young men will have to be kept under prolonged supervision and not given dangerous jobs until their mentality is mellowed, and also until their ability to coordinate their muscular reactions has ripened into maturity. From the standpoint of safety, modern industrial processes are a man's job and not a boy's.

WORKING CONDITIONS. The general response of the body to outside conditions plays its part in causing or preventing accidents. For example, it has been found that temperature has a direct bearing on the frequency of minor accidents, although not of major ones. In munitions works, cuts and minor accidents are at a minimum when the room temperature is between 65° and 69°F. Above or below this range their number rises considerably.

Temperature and its relation to accidents is, however, a vexing problem, as the interests of the production manager in a plant often conflict with those of the safety officer. Whereas 67°F. may be the ideal temperature from the safety point of view, it is often much too high a temperature where the nature of a person's work calls for a great amount of physical energy.

Improper ventilation can also contribute to a rising curve of accidents. By improper ventilation is not meant a deficient supply of fresh air, which everyone knows will impair body efficiency (the basis of proper muscular coordination), but the existence of drafts or annoying air currents. It has been found that in coal mines minor accidents increased as the air velocity rise above 70 ft. per min. At 264 ft. per min., accidents were 68% more numerous. Factory architects of the future will have to take into consideration ventilation plans in their relation to the incidence of accidents.

After the war industrial safety will undoubtedly benefit from what has been learnt as to the part the personal factor plays in its achievement. During the exigencies of total war production, management will have to do the best it can by assigning accident-prone workers to less hazardous jobs and by closer supervision of inexperienced workers.

In the modern industrial plant of the future accident-prone employees will not be permitted to operate high-speed machinery or allowed to work at other occupations where there are accident hazards. They will be given safer work where they will not suffer because of congenital accident-proneness.

Three-Dimensional Seeing Now

You need not wait until after the war to take advantage of this development

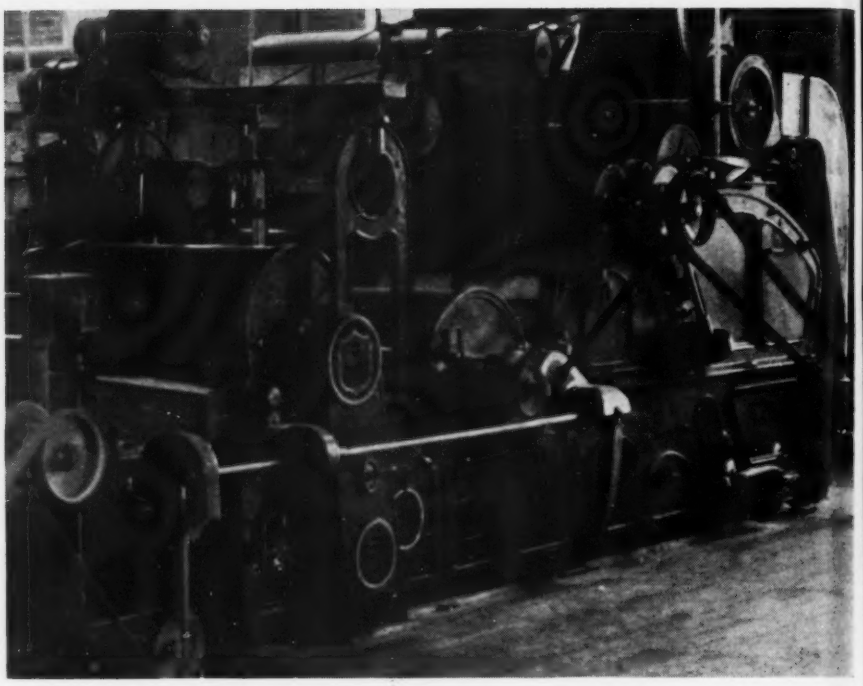


Fig. 1a. Conventional picker room. Machine is painted uniformly with dark-colored paint; dingy walls and ceiling help blot up light; seeing conditions are far from perfect.

INCREASED PRODUCTION, reduction in percentage of seconds, fewer accidents, and improvement in employee morale. These benefits have been reported by textile mills which have adopted a new method of improving seeing conditions through the proper combination of color and light. Called "three-dimensional seeing," this new method is the result of several years of scientific research. Already adopted by several large companies, this development gives promise of revolutionizing the methods of painting ceilings, walls, floors, and equipment in textile mills.

In the average manufacturing plant ceilings are painted white; often the walls too are white, even down to the floor; machines are black, dark gray, or dark green. In such surroundings, piling on high-intensity lighting does not produce the expected improvement in seeing.

Early in 1937, Philadelphia Electric Co. started an investigation to determine how to provide the best natural seeing conditions indoors. Soon afterward the Finishes Division of E. I. du Pont de Nemours & Co., Inc., joined in the investigation. Some of the early work proved that the ability to see quickly, accurately, and comfortably can be greatly improved by creating a favorable color contrast in the vicinity of the work. In later experiments the area studied was extended to include not only the working area, but the entire room, and also to devise a means for the intelligent selection of color for any specific seeing job. These experiments showed that it is practical to increase the illumination from most lighting systems 100% without any change in lighting equipment or any increase in wattage. In addition, they led to the development of a scientific method for selection of colors for any industrial area.

FROM THE STANDPOINT OF VISIBILITY, the working area and its immediate surroundings called for the most careful study. It was found that machinery should be painted in colors having high light-reflection qualities. With such colors, the usable light at the immediate working point is increased. Colors for painting the working areas are referred to as "spotlight colors," the spotlight color selected for a specific job should contrast in hue with the material being manufactured, and it should be continuously stimulating and comfortable to the workers.

Once the spotlight color is selected, the next step, with some types of equipment, is to select a background color of contrasting hue for the body of the machine. This background color also should have a high light-reflection value. As a result of this painting of machinery with light-reflecting colors of contrasting hues, operators see their work in *three dimensions*, sharp and clear.

With many types of textile machinery, however, the practice is to use a light-reflecting color, such as Turquoise Blue, for the body of the machine and a contrasting brilliant color, such as Safety Red, for moving parts and other danger areas.

Treatment of floors, walls, and ceilings is quite important. Here again use of light-reflecting colors is necessary to provide maximum utilization of light. Various combinations of colors are suitable for this purpose. Any combination selected should not cause undue eye fatigue; also the hue and brightness should be of such character as to emphasize a return of the eyes to the working area and to have their greatest comfort while there. One combination recommended is white ceiling, daylight green upper wall, light ivory dado or horizon extending approximately 5 ft. from the floor, and neutral gray floor. Several other suitable combinations are given in the "Color Selector" developed by Du Pont and shown in one of the accompanying illustrations.

COLOR COMBINATIONS RECOMMENDED. Recently, the Finishes Division of the Du Pont company made a survey of a large southern cotton mill and recommended specific color combinations for painting the equipment, walls, and ceilings in the picker room, card room, spinning room, winder room, switchboard room, and machine shop. The combinations recommended are given in the table on page 72.

Similar plans have been adopted by other companies—both in the South

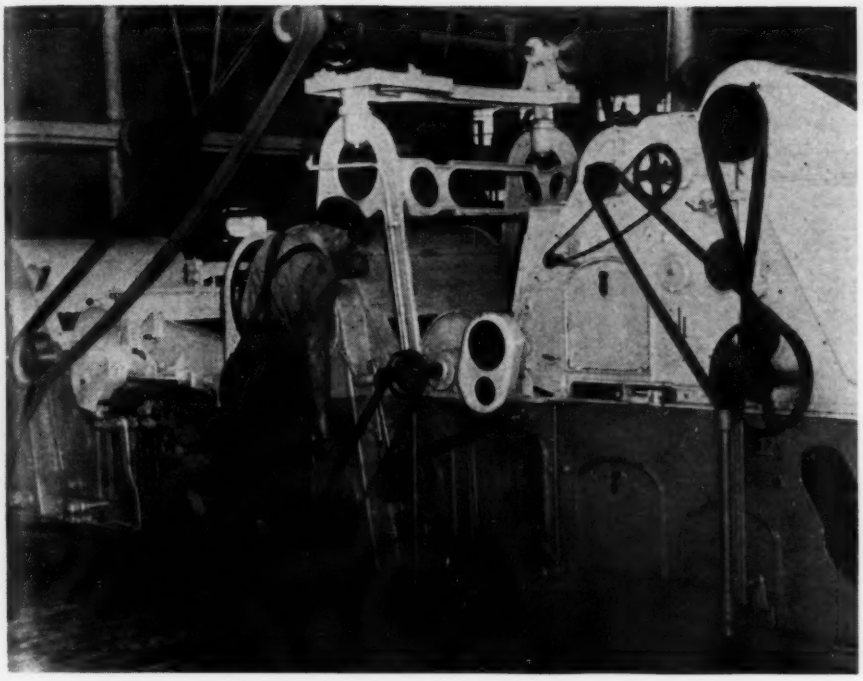


Fig. 1b. Principles of three-dimensional seeing applied in picker room at Langdale (Ala.) Mill of West Point Mfg. Co. Machine is painted two shades of light green and danger points are red.

and in New England. Among these are included several plants of the West Point Mfg. Co., and the Opelika, Ala., plant of Pepperell Mfg. Co. Thus, in the picker room and spinning room at Opelika ceilings have been painted white; upper walls, light green; dado or horizon a slightly darker shade of green; machines, same shade as dado. Incidentally, the reason for using light shades of blue or green in textile mills, rather than the light gray or buff usually preferred for machine shops, is because of the psychological effect of these colors on the workers. That is, the blues and greens are "cool" colors, and are particularly desirable, therefore, in rooms which are kept at relatively high temperatures.

Typical of combinations suitable for machine shops is that employed for painting the milling machines in the Lanett plant of the West Point group. Here the body of a machine is painted a medium gray; the working area, white; pulleys and other danger points, red.

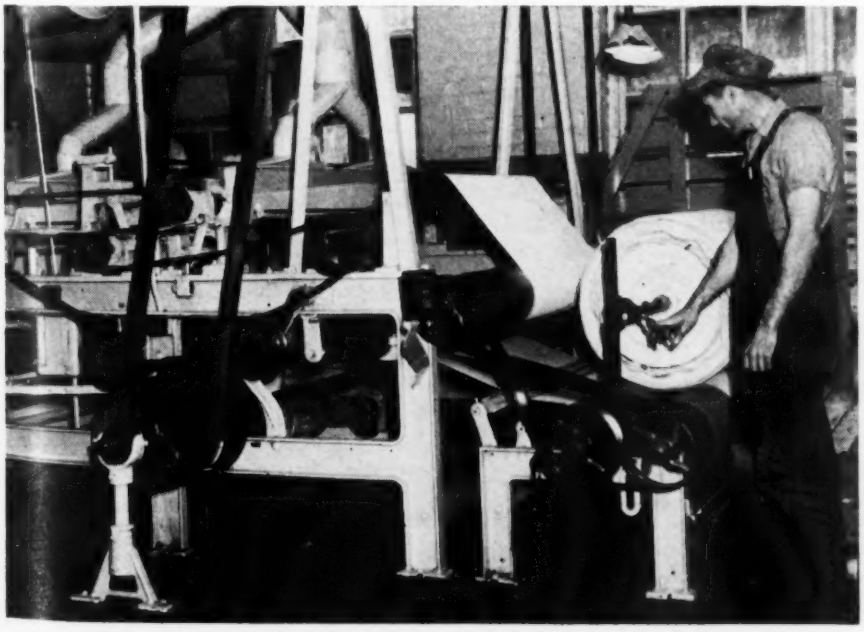


Fig. 2. Cloth room at Dixie Cotton Mills, LaGrange, Ga. Body of machine is light green, pulleys are bright red.

Black-and-white illustrations do not show adequately the results obtained from application of the principles of three-dimensional seeing. However, comparison of Fig. 1a and Fig. 1b will give a fairly good idea of the improvement in seeing conditions obtained by painting textile equipment in light colors, with danger points indicated by red. The picker shown in Fig. 1a, is painted in the conventional manner with a dark-colored paint, whereas the one shown in Fig. 1b is painted in two tones of light green, with pulleys and other danger points in red. The other illustrations in Figs. 2, 3 and 4 give a further indication of the contrast obtained by using combinations of light colors for the bodies of the machines and red for the danger points.

PAINTING AND SAFETY. Speaking on the subject of three-dimensional seeing at the annual meeting of the National Safety Council, Prof. E. W. Winkler, of North Carolina State College, stated in part: "Since the eye is naturally attracted to the brighter points, the painting of danger areas with light colors will improve safety in just about the same ratio that the danger zone stands out from its surrounding parts. The folder may be considered as an example for this type of safety painting. At the end of each stroke, the moving element of the folder comes into close contact with the stationary parts. If the color of the stationary part contrasts with the color of the moving part and the average color of the cloth being folded, the danger point will stand out and there will be less tendency for accidents.

"The picker might be considered as a second example. Although picking is a machine process and involves very little manual work, the controls are usually on the side of the machine and are illuminated from an overhead source, often directly over the machine. Here the location of the light plus the addition of color to the machine and the controls will improve the working area to a great extent. The card may be considered as the third example. Here it is necessary to clean certain parts while the parts are in motion. Highlighting the parts with color emphasizes the boundary line between stationary parts and moving parts, provides more uniform lighting for the worker, and definitely outlines the danger zone.

"In such processes as the handling of raw cotton, breaking of bales, and

COLOR COMBINATIONS RECOMMENDED BY E. I. DU PONT DE NEMOURS & CO., INC., FOR PAINTING CEILINGS, WALLS, AND EQUIPMENT IN VARIOUS DEPARTMENTS OF A TEXTILE MILL.

	Ceiling	*Upper Wall*	*Dado or Horizon*	*Machinery*	*Danger Areas*
Picker Room	White Eggshell Finish	Sea Green Low-Luster Enamel	Jade Green Duco	Spotlight Green Dulux Machinery Finish On pickers, gyrators, conveyors.	Safety Red Dulux Machinery Finish or Spotlight Buff On inner rim and spokes of pulleys, shafts, beltguides and guards, handles, wheels or peddles of operating levers.
Card Room	White Eggshell Finish	Capri Blue Low-Luster Enamel	Turquoise Blue Duco	Turquoise Blue Duco On Cards—arch of cylinder, cylinder head, base of card, lickerin hood, lap roller, doffer hood, doffer gear guard, shield under doffer, coil head, fan housing, lap brackets. On Drawing Frames—big head, foot end, sampsons, base under sliver. On Slubbers—little head, big head, hood over compound, lifting roll brackets, hood over horse head, top carriage, roller beam, shield in front of roller beam, sampsons, lifting roll, motor stands (on machines with individual drives). Light Gray Dulux Machinery Finish On motor and switch box of slubbers with individual motor drive.	Safety Red Dulux Machinery Finish On Cards—loose pulley, lickerin pulley, doffer gear, doffer pulley, handles, rims and spokes of any other pulley. On Drawing Frames—driving pulleys, belt guard, handles, all other pulleys. On Slubbers—loose pulley, guard around loose pulley, belt shipper, shipper handles, tension wheel, handle or button on switch box.
Spinning Room	White Eggshell Finish	Capri Blue Low-Luster Enamel	Turquoise Blue Duco	Turquoise Blue Duco On Spinning Frames—little head, motor stand (on individual drives), roving creel ends, box rail, box-rail guard, rocker arm, thread guide board, creel rod, creel-rod brackets, creel board (edges only), sampsons, big head, white waste box, roving creel (edges only), pulley guards (on overhead drives). Light Gray Dulux Machinery Finish On drives, motor, and switch box of frames with individual motor drive.	Safety Red Dulux Machinery Finish On Spinning Frames—V-belt drive, V-belt drive guard, handles, edges (only) of pulley guards on overhead drives. On Spinning Frames with individual motors—handle or button on switch box.
Winder Room	White Eggshell Finish	Capri Blue Low-Luster Enamel	Turquoise Blue Duco	Turquoise Blue Duco On Model 102 and Model 30 Foster Winders—creel end, little head, conveyor, drop wire plates yoke arbor, bobbin spindles brackets, sampsons, head end, and can cover and waste box of Model 30 winder. On Model 40 Foster Winder—cam housing, sampsons, little end, big end, spindle base and bracket, creel supports, base beam (paint edge only), shield over driveshaft. On Twisters—both ends, thread guide board, sampsons. Light Gray Dulux Machinery Finish On creels, motors, and switch boxes of all winders and V-belt drive on twisters.	Safety Red Dulux Machinery Finish On Models 102, 30, and 40 Foster Winders—handles, handles or button on switch boxes.
Switchboard Room	White Eggshell Finish	Sea Green Low-Luster Enamel	Jade Green Duco (Steel sash & fire door same color)	Spotlight Green Dulux Machinery Finish On back-board and meter boxes.	Safety Red Dulux Machinery Finish On grip handle only of switch handles.
Machine Shop	White Eggshell Finish	Capri Blue Low-Luster Enamel	Turquoise Blue Duco (Tables, benches, & cabinets same color)	Spotlight Buff On working areas and parts that move in and out of working area of lathes shapers, millers, drills, etc. Horizon Gray Dulux Machinery Finish On other paintable parts including base or body of machines.	Spotlight Buff Dulux Machinery Finish

FOOTNOTE: *Columns, beams, and pipes should be painted the same color as the ceiling, upper wall, or dado to which they are adjacent.*

	Fire Fighting Equipment (Except Extinguishers)	*Traveling Blowers in Spinning Room*	*Other Equipment*	*Danger Areas*
Miscellaneous Equipment	Safety Red Dulux Machinery Finish (Joints, elbows, and fittings only on sprinkler lines) (10-in. band around posts on which extinguishers are hung—above extinguisher)	Motor Truck & Wagon Yellow	Light Gray Dulux Machinery Finish On switch boxes, blower track, conduit boxes, motor hangers and supports, motors, humidifier lines, unit heaters.	Safety Red Dulux Machinery Finish On switch-box handles.

feeding the mixer, very little visual effort is required; and hence a low level of illumination is permissible. Between 5 and 10 foot-candles are recommended for this type of work, but this should be uniform and have no extremely bright points to distract the eye.

"Use of light-colored paint in these areas will do much to reduce the visual effort required with the recommended low levels of illumination.

"The weave room represents the other extreme in regard to illumination requirements. Here the worker is dealing with fine yarns, and very often there is no opportunity to produce a contrast by the application of color, unless light reflected from parts of the machine will produce a contrast. Recognition of form and outline, as well as size and detail, can often be improved by a combination of direct and oblique lighting. A small defect in the material will very often develop into a large one unless it is corrected. A combination of overhead lighting, movement of the cloth, noise, and vibration makes it extremely difficult for the weaver to detect errors. It is believed that a uniform general lighting of about 30 foot-candles, combined with about 15 foot-candles of oblique lighting coming from the side at about 20°, will greatly improve the detection of faults and cause less eye strain and fatigue on the part of the weaver.

"The cloth on a high-speed loom has a periodic motion due to the vibration of the loom and also a horizontal motion due to the rate of weaving. Although this periodic motion may be quite small, it is nevertheless great enough to cause eye strain. Since it is impossible to eliminate this periodic motion, the only practical solution for this problem is to determine the right quantity and quality of light to reduce the strain to a minimum. Location of the light unit is important. Quite often the light source is located over the work alley directly opposite the center of the loom. In this case, the weaver's shadow is thrown directly on the cloth, thus adding to the difficulties of seeing.

"The ideal location of the lighting unit is directly over the loom, and for uniform illumination the light-emitting surface should be large."

WORKERS ARE ENTHUSIASTIC. When the theory of three-dimensional painting was first tried out, there was considerable question as to what would be the reaction of the workers. Would employees in machine shops, textile mills, and other plants like the new environment or would they dislike it? Accordingly, after the machines in one machine shop had been painted light green, the workers were asked to give their frank opinion on several questions. Every one replied that he could see better with the new color scheme; and that it was safer than before; 85% of the group said they could work faster and that it was much easier to do better work.

In textile mills which have adopted the plan, the reception of it by the employees has been so enthusiastic as to surprise the management. Operatives take pride in the machines they are running; enjoy the more cheerful environment. The increased production, the reduction in number of seconds, and the decline in frequency of accidents can be estimated with considerable accuracy. It is more difficult to appraise the intangible benefits derived from three-dimensional seeing, but there is unanimous agreement that wherever this method of improving working conditions has been adopted, it has given a decided boost to employee morale.

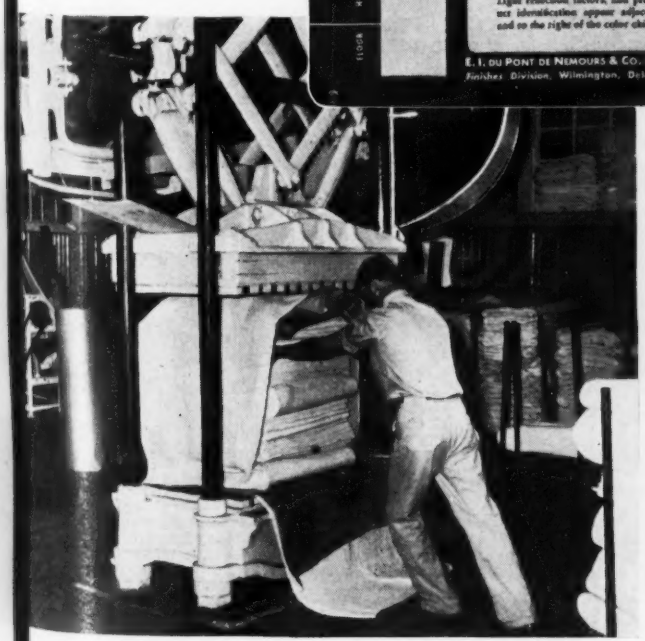
Certain of the data in this article on the scientific aspects of three-dimensional seeing were given originally in the following two papers presented at meetings of the Illuminating Engineering Society: "Improved Vision in Machine-Tool Operations by Color Contrast," by Arthur A. Brainerd and Matt. Denning; and "Salvaging Waste Light for Victory," by Arthur A. Brainerd and Robert A. Massey.

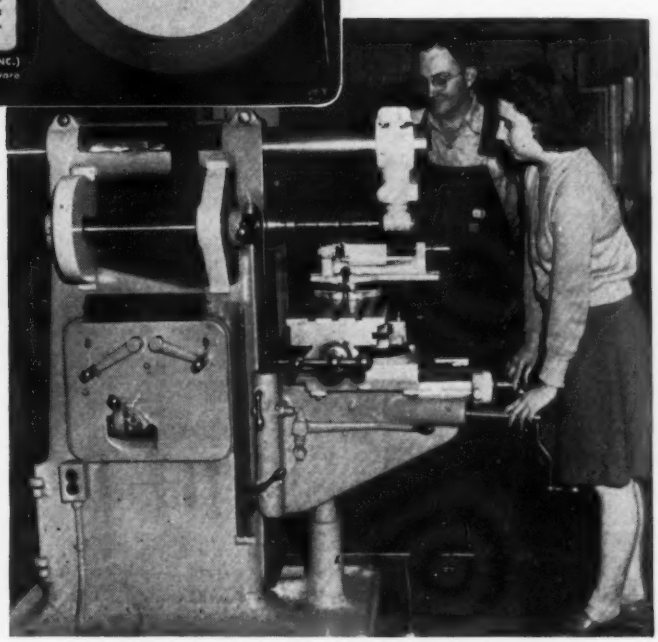
CEILING
WALL
HORIZON
FLOOR
DUPONT
COLOR SELECTOR
For Three Dimensional Seeing
For better working conditions through improved visibility and increased light utilization.
TO SELECT INTERIOR COLOR COMBINATIONS
Pull the slide to view the various combinations. Remove the slide, turn it over, and replace it to view additional color schemes.
Light reflection, factors, and product identification appear adjacent and to the right of the color chips.
E. I. DU PONT DE NEMOURS & CO. (INC.)
Finishes Division, Wilmington, Delaware

Fig. 3. Baling press at Dixie. Machine is painted light green trimmed with black. (Below)

Fig. 4. Milling machine in Lanett Mill machine shop. Combination of medium gray and white brings out in high relief the work in process. (Below)

Fig. 5. Color selector for three-dimensional seeing aids rapid selection of suitable color combinations for machinery, ceilings, walls, floors. (At left)





Yarn Strength Factors

Easily forgotten but important facts reviewed briefly for cotton mill men

"The other day I heard one overseer say to another. 'I have forgotten more about making cotton yarn than you will ever know.' That made me think that over a period of years practical mill experience and laboratory tests have yielded a mass of valuable data on the effect of fiber characteristics, blending methods, twist, moisture regain, etc., on strength of cotton yarn. To refresh my mind, I sorted and re-read material I had collected on the subject, and then decided to condense some of the more important articles, arrange the facts in logical order, and have them typed up so I could refer to them easily. When I looked over the finished job, I decided that, although there is nothing really new in the material, probably there are many other mill men who would like to have it in this condensed form, and that it would remind them of certain things that they knew at one time or another, but may have forgotten. Accordingly I am inclosing a copy of it and you may want to publish it in *Textile World*."—Excerpt from letter from the author of the following article.

By E. H. HELLIWELL

THE FIRST STEP toward securing and maintaining uniformly strong cotton yarn must be made in the classing room. Careful selection of cotton suitable for the yarn numbers to be spun is absolutely necessary.

The relation of the cost of the cotton to the required quality of the finished product should always be considered. A high-priced, long-staple cotton is not required for the manufacture of medical gauze, and a low-grade, short-staple cotton will not give the required strength or appearance to a yarn for fine sewing thread.

The important fiber characteristics affecting yarn strength are as follows: fiber length, fineness or diameter, spirality or convolutions per unit length, body or springiness, strength, and maturity. The most important of these characteristics, the easiest to measure, and the most variable is fiber length. Yarn strength is dependent upon the number of fibers in its cross-section, the length of these fibers, and how firmly they are held in contact with one another by the twist inserted. Fiber fineness determines the number of fibers in a cross-section of yarn of a given count. The spirality and the body of the fibers determine their ability to entwine and retain contact with adjacent fibers.

Fiber strength may vary within fairly wide limits without affecting yarn strength. Fiber slippage is the main cause of yarn breakage. Comparatively few fibers are fractured when a yarn is broken. Cotton technologists estimate that only about 20% of the normal fiber strength is utilized in warp yarn using the twist multiplier giving the maximum yarn strength. Methods now being developed and perfected for binding these fibers together indicate that a greater utilization of this fiber strength is possible without sacrificing yarn elasticity.

Maturity of cotton can affect its properties. Partly mature cotton may have a greater proportion of shorter fibers than fully mature cotton, the convolutions per unit length may be less, and the natural body or springiness may be deficient or lacking. Fiber fineness, strength, and spirality will not vary greatly in normal cotton of the same type and variety. Fiber length and the uniformity of fiber length vary within wide limits in cotton of the same variety.

The commercial classified length indicates only the predominant fiber length in a cotton specimen. It gives no indication of the uniformity of fiber length or the percentage of fibers that are shorter than the stated classified length. Correlation of data obtained in Government tests on 28s yarn show that fiber length accounts for 90% of the yarn strength and that, within certain limits, the yarn strength is proportional to the fiber length. Spinning tests show that the uniformity of fiber length or of the mean fiber length is a better indicator of potential yarn strength value than classified length. Fiber arrays made from different specimens of the same classified length will show this variation in mean lengths and other length values. This variation in fiber uniformity will often account for loss in yarn strength even though the classified length and other factors remain the same.

Sheldon's chart (Fig. 1) shows what can be expected in skein strength for the various staple lengths from ⅞ in. to 1⅜ in. in carded cotton warp yarn. This chart can be used in the selection of the proper staple length for the required strength on the yarn numbers selected.

THE SECOND STEP in securing and maintaining yarn strength is made in the opening room. Perfect blending of the various bales in the mix is essential, and modern multiple blending feeders accomplish this efficiently. Care should be exercised that equal amounts from every bale in the mix are put into the feeder hoppers at each load.

Uniform yarn numbers are necessary for uniform yarn strength. The control of yarn numbers starts with proper control of picker-lap weights. Irregular

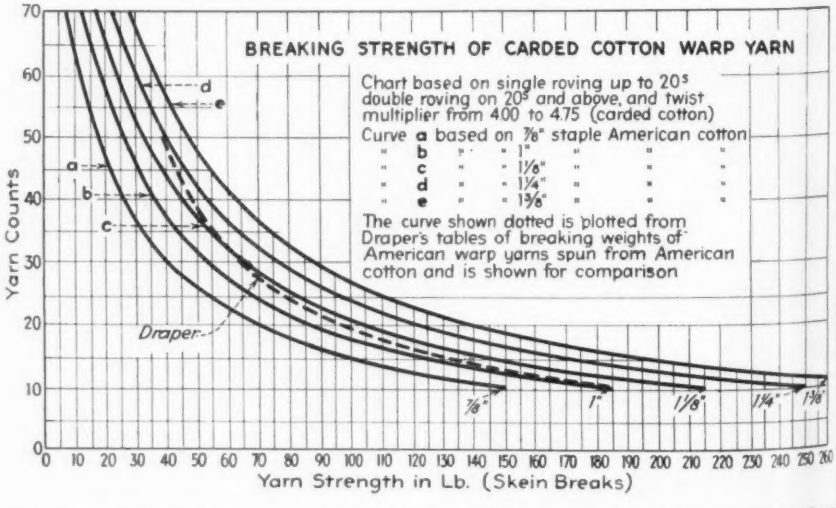

BREAKING STRENGTH OF CARDED COTTON WARP YARN
Chart based on single roving up to 20s double roving on 20s and above, and twist multiplier from 4.00 to 4.75 (carded cotton)
Curve a based on ⅞" staple American cotton
" b " " 1" " " "
" c " " 1⅛" " " "
" d " " 1¼" " " "
" e " " 1⅜" " " "
The curve shown dotted is plotted from Draper's tables of breaking weights of American warp yarns spun from American cotton and is shown for comparison
Draper
Yarn Counts
Yarn Strength in Lb. (Skein Breaks)

CHART showing carded warp yarn strength at 70% relative humidity, computed from formula 1600 $(1 \pm 0.11a \pm 0.01b) \div C = S$, where C = counts, S = strength in pounds, a = difference in sixteenths of staple over or under one inch (use + sign when over, — sign when under), b = difference in number of yarn above or below 28s (use — sign when above, + sign when below).

Fig. 1. Sheldon breaking-strength chart for carded yarns.

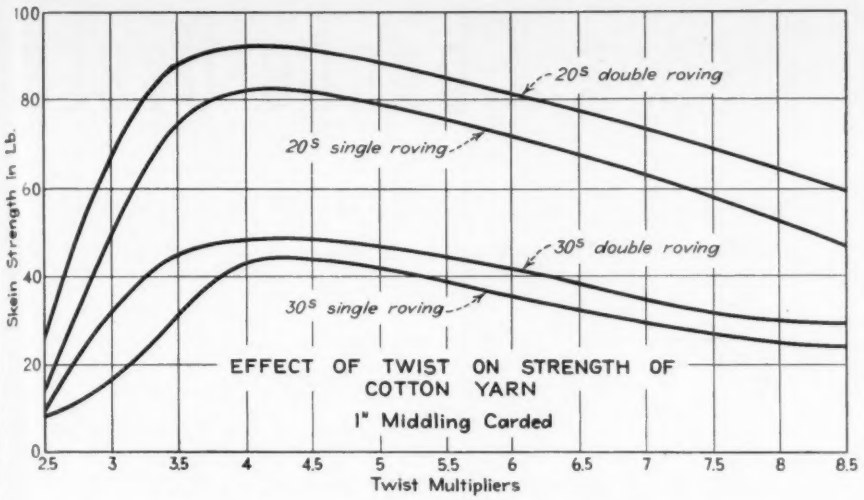


Fig. 2. Chart showing effect of twist on strength of carded yarns.

yard weights of picker laps is sure to be reflected in the yarn numbers.

Excess tension on the card webs between doffer and the large calender roll and on drawing frame webs between front roll and calender roll cause broken selvages. These broken selvages result in fewer fibers in the cross-section of the sliver at the broken spot. These thin places are carried through to the finished yarn. Subsequent doublings may reduce thin places, but will not entirely remove them. Thin places in the sliver mean weak places in the yarn. Tight roving-frame tensions can also cause uneven stretch with resultant thin, strained places in the roving. Presence of neps, broken leaf, or seeds affect the strength of the yarn. Neps inclosed in the body of the yarn prevent the even distribution of the twist inserted. The small thick place containing the foreign matter does not take the twist and causes a weak place in the yarn. Actual nep counts show that cards properly set, with wire in good condition, on medium production, should show nep-removal efficiency of 80% on middling cotton.

Correct roll settings are important on all drafting processes to assure even drafting and proper parallelization of the fibers. These roll settings should be governed by the maximum length of the fibers at the point of processing and not by the classified length of the cotton in the opening room. Due to the removal of fiber crimp, these fibers are considerably longer after drawing and drafting than they are in the bale. Care should be taken that this crimp removal is not carried too far by over-drawing or over-drafting.

Hard cores in drawing sliver, condition of top rolls, and distribution of roll weights all influence the evenness of the yarn and consequently its uniform strength. Examination of fiber arrays made on successive processes from openers to spinning frames prove that fiber breakage is negligible with correct machine settings and speeds.

Warp yarn requires sufficient twist to stand the strain of weaving and to prevent end breakage. Every tooth of added twist means reduced front roll speed and resultant lower frame production and therefore, it should be remembered that twist costs money. Only the minimum twist to obtain the required strength should be inserted. It may be difficult at times to determine what minimum twist will give the maximum strength. Years ago some mills established twist multipliers and have retained them, despite the use of better cotton and improvements in preparatory processes. Full advantage should be taken of these improvements in either stock or manufacturing methods by reducing twist to the minimum necessary to give maximum strength.

The composite graph shown in Fig. 2 is plotted from data obtained from Government tests made on the effect of twist on the strength of 20s and 30s warp yarn made from 1-in. middling carded cotton. The strength of these yarns increases with the increase in twist multiple up to a certain point and then decreases as the twist multiple increases. The maximum strength for a skein break of the yarns were reached with a twist multipler of close to 4.25. The benefits from the use of double roving in the spinning creels appear to be greater with low twist multipliers than with the high multipliers. The difference between this comparatively low twist multiplier of 4.25 and the higher twist multipliers of 4.50 to 4.75 used in most mills on these yarn numbers can be due to one or more of these three reasons: the stock used in these strength tests may have been of better quality, more uniform and more carefully selected; the processing organization, mechanical conditions, adjustments and supervision may have been better; and mill managers may wish to keep this difference between the actual and the theoretical minimum twist multiple as a factor of safety to offset any possible variations in staple quality, yarn number, or atmospheric conditions.

The breaking stress on yarn is applied in a longitudinal direction. Inserted twist resists the slipping of fibers on each other. Excessive twist exerts a shearing action on the fibers. Maximum strength is obtained when a balance is reached by insertion of sufficient twist to resist this slippage of fibers without weakening them by the fiber-shearing action of excessive twist.

Elasticity is an important and desirable property of yarn. It can be described as a change in dimensions which is entirely recoverable to original dimensions on the removal of the applied stress. This elasticity permits a slight yield to take place when a shock is applied to a yarn, as in the process of weaving. This yield relieves or absorbs the shock and prevents rupture of the yarn. The elasticity causes it to spring back to its original position when the stress is removed. While the values of yarn elasticity and yarn strength may not be stated in related units, yet they are dependent upon each other. It is possible to obtain a yarn of maximum strength combined with a high degree of elasticity. A yarn containing excessive twist is deficient in both strength and elasticity. It is important that this spun-in elasticity be retained throughout subsequent processes. Excessive tension in spooling, warping, and slashing may cause a great loss of this elasticity. Improved types of spoolers, warpers, and stretch-control on slashers tend to reduce this loss to a minimum.

Control of atmospheric conditions is of three-fold importance. Proper fiber control is impossible in processing without proper temperature and humidity control. Uniform yarn numbers are necessary for uniform yarn strength. Lap weights and finisher-drawing sliver weights must be corrected to variations in moisture regain to maintain uniform yarn numbers.

Moisture regain affects indicated yarn skein strength. A 1% increase in moisture regain will increase indicated yarn strength about 6%. Correction for moisture regain to the established standard of 7% must be made on all skeins tested to make them comparable to standard strengths or to other skeins tested.

The formula for regain correction is:

$$\text{Corrected strength} = \frac{\text{Indicated strength} \times 142}{100 + (\text{Actual regain} \times 6)}$$

Speeding-Up Weave Change-Overs

Looms set up for civilian work readily shifted to military fabric production

By H. E. WENRICH

PARTICIPATION IN WAR ORDERS for the Army and Navy has one requisite —the goods must be delivered on schedule, and "schedule" may range from 30 days to 120 days or even longer after awards are made. A mill must be able to convert its looms immediately to war work. Every day lost or wasted after an award has been made may result in a penalty if the goods are not delivered as scheduled.

A mill must have a quick, efficient system of expediting change-overs in cloth construction, not only in the weave shed, but in the twisting department. The change-overs described are intended for mills accepting orders for certain military fabrics, such as some types of parachute cloths, lining fabrics, etc.

Generally, the twisting department fills orders for warps of new constructions as they come, often failing to recognize the vital need of planning to get the new constructions through quickly. This department must enter the new warps where harness sets are dissimilar in number of shafts, or harnesses, and in reed counts. The warps are hung in position for entering and handing-in. After entering, the false reed, when one is used, is added next to the front reed so as to complete the job. This slow method of handling necessitates that the warp yarn and the completed warp be on hand before these operations are carried out.

Best results are obtained and considerable time is saved in the twisting room when the new weave construction is given to the foreman long before the yarn required in the new construction has arrived—or at least before the new warps are in the making. This practice allows ample time for planning. Stock may then be taken of the harness sets in storage. If sets entered similarly to the new construction are available, they may be used. Usually, the new construction specifies a different number of shafts or reeds.

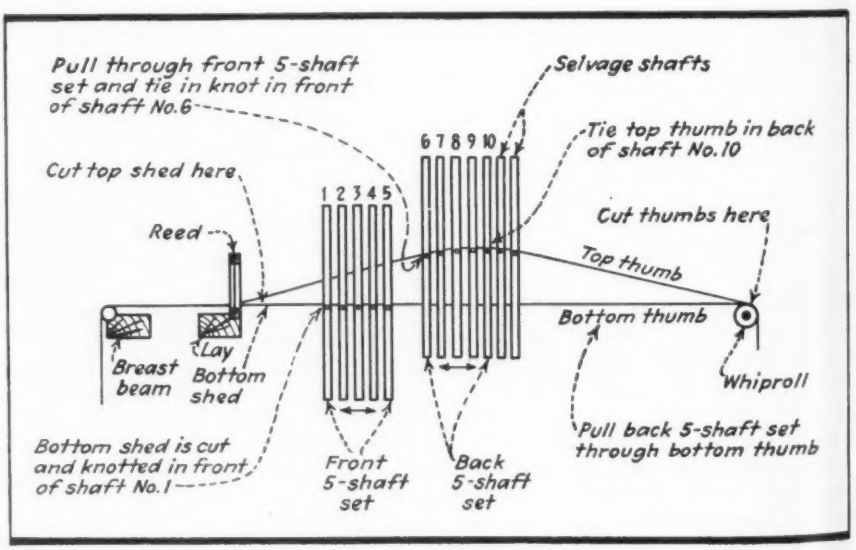
DIFFERENCE IN REED COUNT. If a difference in reed count exists between the old construction and the new construction, the following system may be used to advantage: Assume a new weave to be 37/4/1, 3-leaf twill, 37 in. wide, with 5,476 warp ends plus salvages. In storage are harnesses of a 36/4/1 twill with 148 less ends than the new weave. There are no 37s reeds as ordered available. The yarn is ready to be placed in the loom. Therefore, the logical plan would be to make a few warps 37¼ in. wide in the reed with 5,364 ends plus selvages. Twist these warps into the 36s reed, having the additional ¼ in. of filling yarn to compensate for the loss of a few warp ends caused by using a 36s reed. Weaving can be started. On the arrival of the correct size reeds, the first few 36s reed harnesses used can be retwisted and the reeds changed to the regular count. The remaining warps would be made-up with the correct number of warp ends.

The above example is typical of what can be done to rush a new weave into production when certain reeds are lacking. The reed counts on most weaves can be lowered or increased from one to five dents without materially affecting the hand of the cloth. The main thought to keep in mind on using reeds of higher or less count is to increase the width of the fabric in the loom slightly when reducing the number of warp ends, but drop only a few dents in width when adding a number of warp ends.

HARNESS CHANGE-OVERS. Reed counts are of minor consideration when making change-overs. The real "bottleneck" is found in harness sets. Again, one can work wonders by altering certain sets to fit the newer reeds. To avoid a serious decline in production when emptying looms, the following example illustrates a system whereby the foreman may keep loom-productivity at its peak.

A new construction order specifies a 5-shaft satin. In storage are 6-shaft, 8- shaft, 10-shaft satins, and 6-shaft and 8-shaft tabby weaves. The 8-shaft satins are expensive to construct and frequently called into use—these are left untouched. As the 6-shaft crepes are easier to construct and offer a less costly change-over, these are used for the purpose. If further sets of 5-shaft are needed, the 8-shaft crepes and 6-shaft satins can be used.

The 6-shaft set is placed in a twisting frame and the heading fastened. Yarn to be twisted is brushed and smoothed so the ends are parallel. The front shaft facing the reed is raised about 2 in., bringing the ends on this shaft higher than those on the five remaining shafts. Warp ends entered


Pull through front 5-shaft set and tie in knot in front of shaft No.6
Selvage shafts
6 7 8 9 10
Tie top thumb in back of shaft No.10
Cut top shed here
1 2 3 4 5
Cut thumbs here
Reed
Top thumb
Bottom thumb
Breast beam
Lay
Bottom shed
Whiproll
Bottom shed is cut and knotted in front of shaft No.1
Front 5-shaft set
Back 5-shaft set
Pull back 5-shaft set through bottom thumb

Method of changing a 10-shaft satin to a 5-shaft weave. "Thumbs" mentioned above should properly read "thrums."

through the first shaft, and which are raised, are clipped between the reed and the shaft. These loose ends are brushed out through the back, pulled free, and discarded. The front shaft, minus ends, is lowered for the time being. Place a double cross in the twist ends on the five remaining shafts and twist the new warp by hand. Pull the warp through and cut the twisted section. The loose shaft in front is removed and a reed is attached. The time required for this change-over is slight and represents a saving of several hours over an entered job. On even-numbered harness-sets, such as in preparing a 6-shaft from an 8-shaft, twisting can be done by machine as a true cross can be taken in the ends.

Often it is a simple matter to change over an even numbered harness set to another weave of the same number of shafts, such as changing a 6-shaft crepe, tabby weave, into a 6-shaft satin. Occasionally, there are times when additional heddles must be added to permit the addition of a greater number of warp ends. At other times, a reduction in the number of heddles will be found necessary.

Increase or decrease the number of ends by slipping thin, short transfer ribbons through the heddles while they are still intact upon the frame bars. For transferring entered heddles from a 6-shaft crepe to a 6-shaft satin, 12 transfer ribbons will be required—6 for the top and 6 for the bottom of the harness. It is easy to have all these sets ready with the exact number of entered heddles for twisting when the new warps are moved into the twisting room.

Sometimes it will be found more economical to run a weave with a low number of shafts. Certain harness sets on hand may have twice the number of harnesses, such as a 6-shaft satin to be converted into a 3-shaft twill, etc. To illustrate such a change-over, the following practical plan which has been used successfully in a mill operating on war work, may be used.

A WEAVING MILL producing a 55/5/1 rayon satin had some warps entered on 10 shafts and other jobs on 5 shafts. On the 5-shaft work, it was discovered that weavers made better production and that better visibility prevailed at the loom. It was desired to reduce the 10-shaft work for operation on 5 shafts. To make this change, the entry was cut completely out of the 10-shaft harness as warps ran empty and the heddles were placed on 5 shafts for re-entry.

The writer suggested a change-over and demonstrated the speed of this method which obtained the same results with lower cost, using the following plan. As the warps in the 10-shaft jobs became exhausted the change to 5-shaft was made in the loom before harness removal. The front 5 shafts were lowered, and the back 5 shafts, including selvage shafts, were raised, as illustrated in the accompanying sketch. This brought shafts 6, 7, 8, 9, and 10 into the top shed, and shafts 1, 2, 3, 4, and 5 into the bottom shed. Hold-down springs on the harnesses were released, and the two divided sets moved apart in the center so the mill hands could work freely between shafts 5 and 6.

Looms operating on 8-shaft civilian work such as this may be changed over to 6-shaft Government work with very little loss in production.

With the lay near front center, the warp ends in the top shed are cut in groups of 3-in. widths directly behind the reed and pulled through the first set of 5 shafts and are then knotted in front of shaft 6. After the top shed is thus clipped free and knotted, the twister's thrum behind the harness is clipped near the whip roll. This cutting forms two distinct sets of warp ends—those from the bottom and the top shed. The top shed ends are knotted behind shaft 10; and the bottom shed ends are allowed to hang free, temporarily. The back of 5 shafts with selvage shafts are swung free from the loom, the bottom shed warp ends that are free will slip through between the heddles as the set is moved out. Next, the twister's thrum on the remaining front shafts are tied to shaft 5, after which the ends are clipped free behind the reed and knotted so as to hang in front of shaft 1. The cut-out now forms two 5-shaft sets, each having required number of entered ends for the twisting-in of the new warp.

In the twisting room, the two sets are placed end to end on a work table and the twisted-in heddles of one 5-shaft set, minus the selvage shafts, are transfered over onto the 5-shaft set of the other which includes the selvage shafts. After the transfer, the completed set is placed in a twister's frame and a double-cross taken to permit hand twisting of the ends to the new warp.

Another method of reducing a harness set to half its number, providing the entry is a skip draw, permits the original twisting lease as well as the reed to be left intact for the machine-twisting. The change-over requires the larger set to be of the single-bar type, as the change is to be made to double-bar type frames.

Considering the 10-shaft satin as an example and entered as a skip draw 1, 3, 5, 7, 9, 2, 4, 6, 8, and 10, it may be changed to a 5-shaft satin. The set is placed upon a table and all the bars with heddles intact are unhooked from the 10 harness frames. These frames are removed. Five new double-bar frames are slipped into position and the bars hooked into place. Those bars from the 10-shaft set; bars 1 and 2 are hooked onto the new shaft 1, bars 3 and 4 onto shaft 2, bars 5 and 6 onto shaft 3, etc., until those bars from the 10 shafts have been hooked onto the 5 new shafts. Throughout this operation neither the twister's cross or lease nor the reed has been disturbed.

Warmth Without Weight

Achieved by applying heat-reflecting metallic coatings to various fabrics

For years the heat-insulating properties of certain types of metallic coatings have been recognized by engineers and applied in the construction field, a well-known example being the use of aluminum paint as a coating for gasoline storage tanks. However, the application of heat-reflecting coatings to textiles for the purpose of insulating against the inflow of cold or the escape of heat from within is a comparatively recent development. Experiments carried out by Professor Kirkpatrick of the Department of Sociology, University of Minnesota, indicate that application of a thin metallic coating will increase the warmth of apparel fabrics, blankets, and other textiles. Following is a brief abstract of Professor Kirkpatrick's report. A lengthier resume appears in the May issue of *Textile Research*, and mimeographed copies of the complete report can be obtained from Textile Research Institute, Inc., 10 East 40th St., New York.

By CLIFFORD KIRKPATRICK

CONSERVATION OF BODY HEAT, an old problem for mankind, becomes more serious in time of war. In both World Wars, wounded soldiers and refugees have lain for hours protected from cold only by the fabric which they could carry on their backs. There is great need of materials that can be light, compact, and cheap.

An observation was made by the present writer in December, 1940, that a noticeable increase in warmth resulted when various articles of clothing were sprayed with aluminum paint. Accordingly, a number of additional experiments were carried out. Results were encouraging, and it is hoped that their publication will stimulate still further and more intensive research in this important field.

The experiments made thus far have led to the following tentative conclusions:

1. Aluminum paint applied to textiles on the side placed next to a warm-blooded organism causes a rise in air temperature and assists lowering of skin temperature as compared with a non-reflective paint.

2. Spraying of light fabric even on one side only with aluminum paint permits the reduction of body heat loss from 20% to 40%. It is probable that spraying both sides of the fabric would produce additional insulation effect.

3. Light-weight fabric or paper coated with a reflective film approaches wool fabric in insulation value.

4. A reflective film used for prevention of loss of body heat may be covered with a fabric, worn next to the skin to absorb moisture, without loss of insulation value.

5. A fabric to which a reflective surface is applied may be sufficiently porous to permit the necessary air circulation and evaporation of perspiration and yet have marked insulation value.

6. A fabric with one side more reflective than the other is a better insulator with the brighter surface outside away from the heat-radiating body. This finding is of great importance. It opens the way, for example, to some degree of flexibility in the control of heat loss by reflective media. It is decidedly favorable to the practical use of a reflective film in the insulation of clothing.

IN THE PRELIMINARY EXPERIMENTS one of a pair of canvas work gloves was sprayed on the outside with aluminum paint, and the other was sprayed with mahogany stain. Thermometers were inserted to exactly the same position after the gloves had been put on. Contact with the skin was avoided. The painted surface was turned inward in the case of each glove. At the end of 15 min. there was a temperature rise of 5° C. with the aluminum-sprayed glove and 1.5° C. with the mahogany-stained glove, indicating that the aluminum-sprayed glove has a much greater insulating effect.

Later experiments made in collaboration with Dr. Herman Kabat, of University of Minnesota Medical School, showed that the loss in body temperature of an anaesthetized cat wrapped in mahogany-sprayed sheeting dropped 4.5° C. in 1 hr. 40 min. as compared with a temperature drop of 3.2° C. for a cat wrapped in aluminum-sprayed sheeting. That is, the drop in body temperature was 28.9% less with the aluminum-sprayed sheeting. If 28.9% of the temperature loss suffered by wounded soldiers could be eliminated without adding weight to their equipment, many lives might be saved.

The next experiments showed that the insulating value of aluminum-sprayed sheeting is greater when the reflective film is on the side of the fabric away from the heated body, and still further experiments indicated that a very light material with a reflective film turned outward approaches the insulation value of a double layer of heavy wool fabric.

In an attempt to corroborate this latter finding three cats of similar fur thickness were each given 35 mg. of Nembutal per kilo. Cat A was wrapped in mahogany-stained sheeting; Cat B, in aluminum-sprayed sheeting; Cat C, in four layers of wool blanket plus a cotton cloth. Room temperature was lowered. At the end of 1 hr. 6 min., body temperature of Cat A had dropped 5.8°C.; Cat B, 3.3°C.; Cat C, 2.1°C.

That is, the reflective film adds insulation value to the extent of about two-thirds the difference in insulation value between a cotton sheet and several layers of wool blanket. Again it may be noted that such an addition to the warmth of blankets could be a matter of life and death for wounded soldiers, whose physiological condition resembles in many respects that of anaesthetized cats.

ANOTHER QUESTION ARISES concerning the practical application of insulation methods here discussed; namely, the compatibility of reflectivity with the degree of porosity of fabric necessary for the evaporation of moisture from the skin. There seems to be no difficulty here, however, in view of the fact that cotton sheeting used for experimental purposes was sprayed so thinly with aluminum paint that light and air could still pass through the fabric.

As mentioned above, the experiments showed that the side of the fabric away from the radiant body is one which should have the reflective film. This experimental result favors the use of a reflective film to increase the insulation value of clothing, since a metallic surface need not be in contact with the skin.

The crudity of the methods used in these preliminary experiments can only be excused by the importance of warmth without weight or bulk and by the originality of the proposals made here. A fairly extensive survey of the literature from 1925 to 1940 seemed to indicate a surprisingly neglected area between the fields of physics, engineering, chemistry, home economics, and physiology. Nowhere was the insulation of clothing by means of a reflective film clearly suggested.

After Boiling-Out—Use Bicarbonate

New method for treating textiles has advantages over customary acid sour

By A. L. DUBEAU
and G. P. VINCENT
Mathieson Alkali Works, Inc.

FOR MANY YEARS it has been customary to sour textiles in dilute sulphuric or hydrochloric acid after they have been boiled-out in caustic soda. This treatment discharges any traces of caustic left in the goods by changing it into a neutral salt and thus prevents subsequent injury to the fibers, uneven dyeing, and other troubles due to residual alkali. There are certain disadvantages connected with the use of acid. Acid-resistant equipment must be used; health and other hazards are created; and, as goods may be tendered by hot acid, they must be soured and washed cold, which fails to develop their maximum whiteness and softness.

A new method of treating textiles after they have been boiled out eliminates all these disadvantages. In this method, sodium bicarbonate is used in place of acid and discharges the residual caustic by changing it into sodium carbonate, or soda ash. Stated in chemical terms, the reaction is as follows:

$$NaOH + NaHCO_3 = Na_2CO_3 + H_2O$$

This process is also applicable to goods boiled in milk of lime. In this case, the hydrated lime left in the goods is changed into calcium carbonate.

Sodium carbonate is, of course, a much weaker and less corrosive alkali than caustic soda, and, since it does not cling to the fibers as caustic soda does, it is easily washed out. Hence, goods treated by this process are in no danger of being damaged by residual alkali.

Specific instructions for applying the bicarbonate process are given below, together with similar instructions for applying the acid process, for the sake of comparison.

Jig Scouring. In this operating, the goods are scoured for from 15 min. to 2 hr. in a 5 to 7% solution of caustic soda at 180°F. Further treatment of the goods if they are to be dyed without bleaching is as follows:

ACID PROCESS

1. Wash in cold water.
2. Sour in cold acid—0.25 to 1.5%.
3. Wash in a cold solution of sodium carbonate.
4. Wash in cold water.

BICARBONATE PROCESS

1. Wash in hot water.
2. Treat with 3% bicarbonate at 180°F.
3. Wash in hot water.

If the goods are to be bleached the treatment after boiling-out is as follows:

ACID PROCESS

1. Wash in cold water.
2. Sour in cold acid—0.25 to 1.5%.
3. Wash in cold water.

BICARBONATE PROCESS

1. Wash in hot water.
2. Treat with 3% bicarbonate at 180°F.
3. Wash in cold water.

Continuous Jig Scouring. With commonly used equipment for performing this operation, the goods are scoured by treating them for about 2½ hr. in a 7% solution of caustic soda at 180°F., and are then passed through a series of open soapers, each of which consists of five boxes. These soapers are arranged as follows for the two treatments:

ACID PROCESS

1st soaper—4 boxes, cold water;
1 box, cold 1% acid.
2nd soaper—4 boxes, cold water;
1 box, cold 1.5% to 2% sodium carbonate.
3rd soaper—5 boxes, cold water.

BICARBONATE PROCESS

1st soaper—4 boxes, water at 180°F.;
1 box, 3% bicarbonate.
2nd soaper—4 boxes, hot water;
1 box, cold water.

Advantages of the bicarbonate process as compared with the acid process may be summarized as follows:

1. Acid resistant equipment is not required.
2. No health or other hazards are involved.
3. The goods may be washed in hot water and treated in a hot bicarbonate bath, which makes them whiter, cleaner, softer, and more absorbent, and permits deeper and more even dyeing.
4. In many applications, one or more of the steps required by the acid process may be omitted, thus speeding up production.
5. Careful chemical control is not required, as neither the amount of bicarbonate nor the concentration of the solution used is critical. As a rule, 3 or 4% solutions of bicarbonate will give satisfactory results, but stronger or weaker solutions may be used, depending chiefly upon the amount of residual caustic left in the goods.

Goods which have been boiled-out on jigs can be treated with 3% of sodium bicarbonate to change the residual caustic into sodium carbonate and then washed with cold water to free then from alkali.

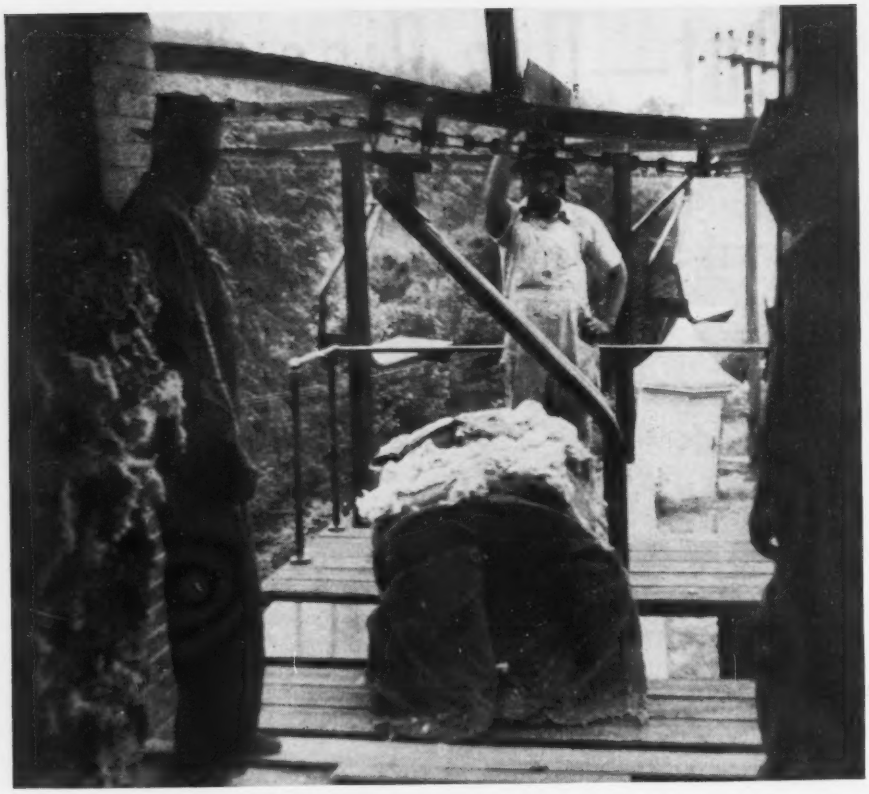


Fig. 1. Pick-up station; warehouse crew is waiting for scoop to pick up a bale before they place another one on the platform.

Unique Outdoor Conveyor System

Transports cotton bales from warehouse to the opener room at Pacolet Mfg. Co.

Fig. 2. Part of warehouse showing pick-up stations at various floor levels with scoops traveling down the "dips."

TIME AND LABOR involved in transporting cotton bales from the warehouse to the opener room at Pacolet (S. C.) Mfg. Co. have been reduced by installation of an automatic, outdoor conveyor system. D. W. Anderson, president of the company, was not satisfied with the method formerly employed for getting bales from the warehouse to the lower mill. Accordingly, he asked Lockwood Greene Engineers, Inc., to work out a better system. The method proposed and put into effect is believed to be the only one of its kind in the South. When the system was first put into operation, a few minor difficulties were experienced, but these soon were overcome, and it is now giving complete satisfaction.

A survey of the problem indicated that the lower mill should have its own cotton receiving center, grading room, and storage warehouse. To make this possible, an obsolete power plant build-

ing, located on the river bank about 400 ft. from the opener room and original warehouses, was remodeled and converted into a receiving center and warehouse. The railroad siding is at the top-story level; and a covered, concrete receiving platform was built here. The front part of the top story was partitioned off for a skylighted grading room. The front of the building next to the river bank was remodeled into a four-story warehouse, with an outside loading or pick-up station at each level.

Cotton bales are unloaded from freight cars onto the receiving platform and are trucked to the grading room. From the grading room they are transferred by means of ramps or trap doors to one of the four warehouse floors. A Link-Belt endless-chain conveyor of special design traveling outdoors on overhead rails carries the bales from the pick-up stations at the warehouse directly to the opener room or to another warehouse adjacent to the opener room. The distance from the warehouse to the opener room is approximately 400 ft., but a total of 1100 ft. of track is needed to provide a return and the multi-level pick-up. For picking-up the bales, the conveyor is provided with 54 heavy scoops spaced every 20 ft. 8 in.

One of the pick-up stations, with warehouse crew waiting for a scoop to pick up a bale before they place another one on the pick-up platform, is shown in Fig. 1. Dips in the conveyor track allow an empty scoop to go under and pick up a bale which has been placed on any pick-up platform. Some of the pick-up stations at various floor levels, with scoops traveling down the "dips" to pick up a bale, are shown in Fig. 2. A close-up view of a scoop going down a dip to a pick-up platform is shown in Fig. 3.

A section of the conveyor system with bales traveling from the warehouse to the opener room and empty scoops returning to the warehouse for more bales is shown in Fig. 4. Trip bars at the doors of the opener room and the warehouse adjacent to this room, trip the scoops and allow the bales to drop off.

Power for the entire system is furnished by a 2-hp. motor housed on the opening-room platform. The motor has a shearing pin so designed that the pin will shear and prevent damage if the system jams. Trouble was experienced at the start when the slack in the chain caused the link belt to slip off at the turn. This has now been remedied by an automatic counter-weighted take-up of the slack. The tripping device also caused considerable trouble at first, due to the scoops swaying after delivering the bales. However, a small change in the design of the tripping device has eliminated this trouble. At present the conveyor travels at a constant speed of 18 ft. per min., and 50 bales an hour can be delivered from the grading and storage centers to the mill warehouse or opener room; 35 bales is the maximum load on the conveyor at one time going to the opener room, while the other scoops after being unloaded are returning to the storage warehouse for another load. Provisions have been made for changes in the speed by addition of a Reeves variable-speed drive, and experiments will soon be made at a speed of 75 bales an hour.

Fig. 3. Close up of pick-up station showing dip in conveyor track and scoop passing over a platform.

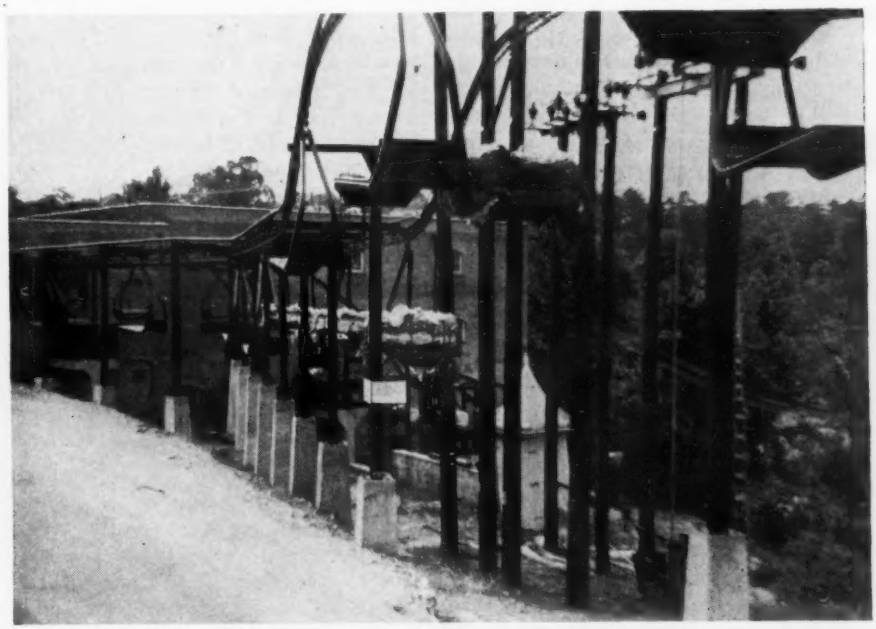


Fig. 4. Section of conveyor system showing bales traveling to opener room and empty scoops returning to warehouse.

MANUAL OF MILITARY FABRICS

Part IV—8.2-oz. Cotton Twill, Type II

Manufacturing and processing details for uniform fabric covered by Army Specification No. 6-201B

FOR USE IN ARMY UNIFORMS the Philadelphia Quartermaster Depot requires large quantities of 8.2-oz. cotton twill in five types. These fabrics are covered in Army Specification No. 6-201B, issued Dec. 9, 1942, which supersedes Army Specification Nos. 6-201A, 6S-201A, and 6-237. Production of Type I twill was described in Part III of this manual in our April issue. Below is given a brief abstract of that part of Specification No. 6-201B, which relates to Type II twill, followed by detailed information—not given in the specification—on the manufacture and processing of this fabric.

To meet the need by textile mills for complete data on gray constructions, yarn organizations, weaving, and finishing of fabrics required in large quantities for military use, TEXTILE WORLD, with the approval of officers of the Quartermaster Corps, began publication in the February issue of a Manual of Military Fabrics. The mill organizations and other manufacturing and processing data were furnished through the cooperation of textile mills which are producing this fabric under Government contract. It is recognized that other plants having different types of equipment will have to make some modifications in the organizations, formulas, and procedures presented. Accordingly, these data should be regarded not as "standards" which must be followed, but as guides to the more efficient production of this fabric. Parts previously published are as follows: Part I, 5-oz. Poplin Type II, P.D.Q. No. 1, February; Part II, 6-oz. Cotton Twill, Army Specification 6-311, March; Part III, 8. 2-oz. Cotton Twill, Type I, Army Specification, 6-201B, April.

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Abstract of Specification

Cotton: The cotton shall be of suitable length of staple and grade to meet the requirements of this specification. When irrigation-grown cotton is used, it shall not be blended with other cottons at any stage in the manufacture of this fabric.
Yarns: The cotton yarn shall be thoroughly cleaned, evenly drawn and spun; warp yarn shall be 2-ply; filling yarn shall be singles.
Color: Color shall be of khaki, olive drab, or any other color as specified in invitation for bids of the same shade as shown by the standard sample. Cloth shall be evenly dyed with vat colors and shall show a good fastness to the following tests: *Fastness to Weather*—Samples to be exposed for 30 days. *Fastness to Laundering*—Test to be conducted by washing procedure as outlined in Federal Specification CCC-T-191a. *Fastness to Bleaching*—Tests to be made as outlined in Specification No. 6-201B. *Physical Requirements*—Width shall be not less than 28 or more than 57 in.; weight per square yard—7.80 minimum, 8.60 maximum; ends and picks minimum 116 x 56; breaking strength minimum, by 1x1x3 grab method, shall be 180 lb. warp and 110 lb. filling. Weave shall be four harness twill to the right, 3 up, 1 down. *Finish*—the cloth shall be closely singed, bleached, fully mercerized, and shall contain no sizing. Fabric shall not shrink more than 1% in either the direction of warp or filling when subjected to tests for shrinkage in laundering, Section XIV, Federal Specification CCC-T-191a. When specified in the invitation for bids, the cloth shall be given a water-repellent treatment to provide a spray rating of 90 initially; after 3 launderings or 3 dry-cleanings, 80.

The methods of testing described in Federal Specification CCC-T-191a, wherever applicable, shall be followed.

Manufacturing Details

Yarn manufacture—Yarns are made on standard-combed yarn equipment without special settings other than given in speeds and feeds of the picker through to the spinning. At the spinning, in some cases, the filling is spun with a heavy traveler to break back weak yarn. Filling is spun in a warp frame and slubbed at the quiller operation to give a more even fabric. If shorter stock has been run, roll settings must be changed to suit staple length. Clean stock is necessary.

Opening, blending, picking, carding, combing, and drawing organizations (designated No. 4 in every case) are the same for both warp and filling. Double roving is used for the spinning. Roving organization No. 5 for 4.5 h.r. and Spinning Organization No. 7 for 36s warp are employed for making the warp yarn. Roving Organization No. 6 and Spinning Organization No. 8 for 12s filling are used for the filling yarn.

Also suitable for producing the warp are the following organizations given in Part III of this manual for the Type I Twill: Opening, blending, picking, carding, combing, and drawing organizations No. 3; Spinning organization No. 5; Winding and Twisting organization No. 2 and Size formula No. 3.

Fabric manufacture—Set loom to get a good face on the twill and tension to take picks well.

Looms suitable for weaving this fabric include Draper K Model equipped with Midget feeler, Roper let-off, Stafford thread cutter and are run approximately 160 p.p.m.; Draper Models E, X, X-2, XK, and XD; attachments recommended are: Nutting bar take-up; Stafford thread cutter; and Midget feeler; loom speeds require adjustment to the fabric—especially if high-production fabric was formerly run on them; Crompton & Knowles Looms suitable for the twill include the C-3, C-4, C-5, and C-6; no changes are recommended in the equipment of these looms; loom speeds can be adjusted to secure maximum production of first-quality cloth. Either cloth room organization No. 3 (Part III of this manual) or No. 4 organization is suitable.

Finishing Details

Scouring and Mercerizing — Follow procedure outlined in Part II of Manual (TEXTILE WORLD, March, 1943).

Dyeing—For producing olive drab shade usually required use Vat Dyeing Formula No. 3, 4, or 5 and procedure for Type I Twill outlined in Part II of this Manual.

Finishing—If water-repellent finish is specified in invitation to bid, follow procedure outlined in Part I of this Manual (TEXTILE WORLD, February, 1943). Preshrink on Sanforizing machine or other preshrinking equipment to give residual finish of not more than 1% in either warp or filling. Finished width, exclusive of selvage, to be not less than 28 in. nor more than 57 in.

Inspecting and Folding—Follow procedure outlined for Type I Twill outlined in Part III of this Manual.

Mill Organizations for Type II 8.2-oz. Cotton Twill

Opening and Blending Organization No. 4

Grade—Strict Middling, white
Staple—1 5/16 in.
Mix—12 bales
Processes—Bale breaker, No. 7 mixing and blending feeder, Centrif-Air machine, ageing bins.

Picking Organization No. 4
12 oz. lap

One process

Type beaters:
24-in. Aldrich Buckley-Back
Kirchner-Front

Beater Speeds:
450 r.p.m. back
900 r.p.m. front

Carding Organization No. 4
42 gr. sliver

440 r.p.m. lickerin
165 r.p.m. cylinder
6.5 r.p.m. doffer
3 in. min. flats
50 in. dia. cylinder
27 in. doffer
100 cylinder wire
110 doffer wire
110 flat wire
42 gr. sliver
117.5 draft (waste deducted)
5.75 lb. per hr. pro.
6% waste

Main Settings:

0.012 Feedplate to lickerin
0.007 in. lickerin to cylinder
0.007 in. doffer to cylinder
0.009 in. flats to cyl. Points—1-2-3 (front)
0.009 in. flats to cyl. Point—4-5
0.022 in. front plate
0.017 in. back plate (top)
0.022 in. back plate (bottom)

Combing Organization No. 4
58-gr. sliver

Sliver Lapper
28 ends up
550 gr. lap
2.14 draft

Ribbon Lapper
6 doublings
600 gr. lap
5.5 draft

Comber
112 nips per min.
18% waste
58 gr. sliver
67.86 draft
20 lb. per hr. pro.

Drawing Organization No. 3
58-gr. sliver

1st and 2nd Drawing
225 r.p.m. F. R.
1 1/4 in. dia. F. R.
5 Draft
Type rolls:
Top: metallic
Bottom: metallic

Roving Organization No. 5

Slubbers
9.75 draft
136 F. R. speed
1 1/4 in. dia. F. R.
1.40 hand roving
1.21 twist

Speeders
6.43 draft
130 F. R. speed
1 1/8 in. dia. F. R.
4.50 hank roving
2.12 twist

Roving Organization No. 6

Slubbers
6.96 draft
162 F. R. speed
1 1/4 in. dia. F. R.
1.00 hank roving
1.02 twist

Speeders
5.20 draft
177 F. R. speed
1 1/8 in. dia. F. R.
2.60 hank roving
1.53 twist

Spinning Organization No. 7
36s yarn

4.50 hank roving double
16 draft
137 F. R. speed
1 in. dia. F. R.
3.67 twist multiple
Z twist Direction of twist
8 gr. traveler (weight of 10)
1 5/8 in. ring size
Warp bobbin type pkg.

Spinning Organization No. 8
12s yarn

2.60 roving-double
9.23 draft
156 F. R.
1 in. dia. F. R.
3.5 twist multiple
Z direction of twist
16 gr. travelers (weight of 10)
1 5/8 in. ring size
Warp bobbin type pkg.

Winding and Quilling Organization No. 3

Winding
Cone type pkg.
2 1/2 lb. cone

Quilling
Quill type pkg.
7 3/8 in. quill
1.04 oz. per quill
7 yd. bunch
1 3/4 in. taper

Winding and Twisting Organization No. 4

Doubler type pkg.
2 1/2 lb. pkg.

Twisting
36 yarn No.
2 ply
S direction of twist
2 in. ring (horizontal)
No. 8 traveler
3.65 twist multiple
110 F. R. speed
1 1/2 in. dia. F. R.

Winding
Cone type pkg.
2 1/2 lb. per pkg.

Warping Organization No. 4

20,000 yd. length set
10 beams to set
420 & 421 ends per beam
Magazine type creel, 460 ends capacity

Slashing Organization No. 4

26 yd. per min. slasher
2 1/2% size added

Size formula
60 lb. potato starch
2 lb. softener
18 lb. binder
3/4 pt. penetrating oil
192 gal. finished

Drawing-In and Weaving Organization No. 4

8.15 oz. per sq. yd. twill 36 in. finished width

Drawing-in
4 or 8 harness
1045 or 522 ends per harness
Cam or dobby type harness
12 in. length heddle
Flat steel type heddle
Mech. or elec. type drop wire
0.008 to 0.009 in. thick

Weaving
Gray: Oz. per linear yd. 9.09; yd. lb. 1.76 width 40 in.
Warp ends in. 104.5; picks in. 56
Warp yarn 36/2; fill. yarn 12/1
Percent of warp 60.07 percent filling 39.93
Selv. threads 36/2
Ends selv. 24 draw; 2 per eye, 4 per dent
Reed D/in. 34.25; ends/dent 3
Reed spread 40.84 in.; No. harness 4 or 8 (plus tape or selv. har.)
Ends per eye 1; Weave 3/1 Twill to right
Take-up warp 12%; Take-up fill. 2.05%

Cloth Room Organization No. 4

No. inspections—One
Type inspections—Knots to back-table
No. sides burled—Face
No. Brushings—1
No. Shearings—1
No. Runs Napper—None
Type grading—Table
Folding—Folded
Length of fold—1 yd.
Bales or rolls—Bales
Fin. yd. per cut—53 up
Total yd. per pkg.—1000 approx.

Burlington Mills Laboratory

Is organized and equipped for research, new-product development, quality control

Bur-Mil Laboratory ,where scientific testing and research work for the 44 mills in the Burlington group are centralized.

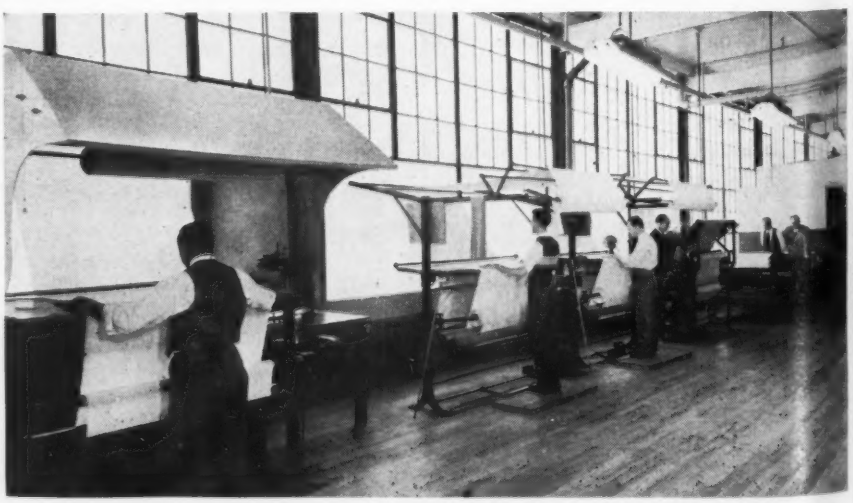
THROUGH ITS NEW LABORATORY, recently enlarged to handle its war work, Burlington Mills Corp. establishes and controls the quality standard of its products, coordinates the ideas which originate in the several mills for improvement of products, and centralizes its scientific testing and research work. For each of the 44 individual mills in the Burlington group, this modern laboratory provides an organization and facilities which no one mill in group could maintain alone. In addition to the usual divisions for carrying out research, routine testing and analyses, and quality control work, there are two other divisions which are unique in their functions—the re-inspection department and the war division.

In the re-inspection department a re-check is made of goods previously inspected and graded by the individual mills. Defects of all kinds are searched for and rated. The cuts examined are taken at random from the output of each mill, a certain proportion automatically being diverted to this re-checking department. Reports on condition of the fabrics are made promptly to the mill and to the director of manufacturing operations for the corporation. The work of the re-inspection department gives double assurance to the company's customers that the products received will meet their requirements.

The work of the special war fabrics testing division, although not in normal times strictly a part of the laboratory's work, is at present of great importance. Charged with the task of following through on all Government contracts from the time the goods are manufactured up to final acceptance by the purchaser, the trouble-shooters in this division must first know the goods, know the Government's requirements, know the possibilities in regard to finishing, know and not hope the goods will be accepted. The main contact on fabric testing is with the finishers, and it has been proved that a sympathetic and constant liaison here facilitates a smooth flow of production of Government fabrics.

Burlington Mills is the world's largest producer of rayon fabrics, with an output of more than 200 million yards annually. The company operates throwing plants, spinning mills making cotton and spun rayon yarns, weaving mills, knitting mills, and finishing plants—in North Carolina, Virginia, and Tennessee. Each unit has its individual management and operates more or less independently of its associates, yet each one reports to the director of manufacturing, at the main office in Greensboro. Before the war the chief products of Burlington Mills Corp. in the fabric field were fine rayon dress goods and underwear fabrics. Now the U. S. Government is its biggest customer, as the great majority of its forward business is war work. More than 20 different types of fabrics are being made for the Army and Navy and other Government agencies. These include fine-denier Nylon fabrics; heavy 2-ply, 300 den., rayon fabrics; rayon-cotton fabrics; all cotton fabrics; and other fabrics of special constructions.

RAPID CHANGE-OVER from civilian to military products involved many problems. The quick solution of these problems is due in large measure to the work of the laboratory. Housed in a modern structure, the laboratory is or-



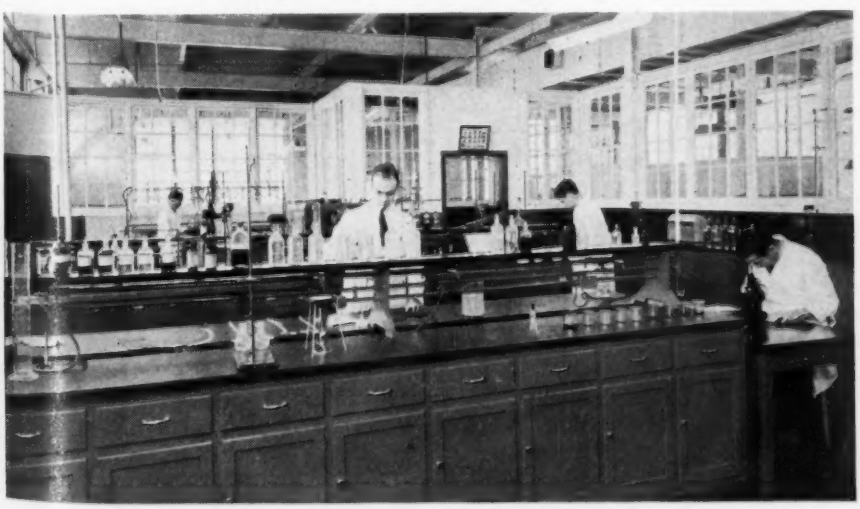
Re-checking department where a re-check is made of goods previously inspected and graded by individual mills of the Burlington group.

A corner of the yarn and fabric laboratory in which all types of physical tests are made on the numerous types of yarn used, and fabrics produced by Burlington.

ganized and equipped to carry out research, new-product development, and quality-control work. Specialized executives and some 60 technicians—about half of whom are women—are employed in the laboratory.

Conversion from production of peace-time to war-time fabrics involved the adaptation of standard constructions to new uses, development of entirely new constructions, and use of substitute fibers, as well as determining the best oils, sizes, and other manufacturing supplies to be used in making these war fabrics. Equipment was installed in the laboratory to permit thorough testing of these new raw materials, yarns, and fabrics. Quick decisions and prompt action are possible because of the location of the laboratory at company headquarters.

Through the Bur-Mil quality-control plan, the company assures its customers that all fabrics bearing the Bur-Mil trade-mark meet definite standards for fastness of colors, shrinkability, etc. In the yarn and fabric laboratory, yarns are tested for strength, elasticity, count, twist, uniformity, and other properties. Fabrics are subjected to tests to determine strength, porosity, shrinkability, permanency of set, and other characteristics. Construction analyses are made frequently, and studies made when necessary on a Readex, which permits visual examination of samples under high magnification. In this laboratory, atmospheric conditions are maintained uniformly to achieve best results.



Chemical laboratory. Here analytical and research work solves many current problems and lays the ground-work for future developments.

THE CHEMICAL LABORATORY is fully equipped and staffed for carrying out tests and chemical analyses not only of yarns and fibers, but also of the materials employed in processing. For example, all soaking oils, sizing agents, tints, dyes, and finishes used in the company's plants are tested. In addition to routine testing and analysis, there is a considerable amount of research and new-product development being carried out in the laboratory. As a result of this research and development work, a number of important improvements have been made in certain products, and several others are in the offing.

In the 40-odd mills of the Burlington network there is an army of 16,000 employees. In the laboratory there is a staff of about 60. In both groups every individual is doing his part in the war effort. But there is one difference of attitude. The employees in the mills are concentrating on today's needs. The members of the laboratory staff are not neglecting today's urgent tasks, but, in addition, they are looking ahead to the post-war era. They have started planning for the reconversion of the mills from war-time to peace-time products. They have begun their researches on the adaption of military fabrics and finishes to civilian needs. They have commenced the search for new products to meet the demands which will arise after the war for better and still better fabrics made from rayon and other man-made yarns.

Strict Control of Carbonizing

Automatic instruments at Botany keep acid bath at desired concentration

DEFINITE BENEFITS RESULTED when Botany Worsted Mills, Passaic, N. J., changed from manual control to automatic instrument control of carbonizing baths. With this change came an improvement in the levelness of shade of the fabrics which this company is producing in large quantities. The change has been advantageous also from the viewpoint of the mill. Less acid is used, production proceeds with greater smoothness, and the effect on other processes of any changes made in acid concentration can be studied accurately and objectively by consulting the records made by the control instrument.

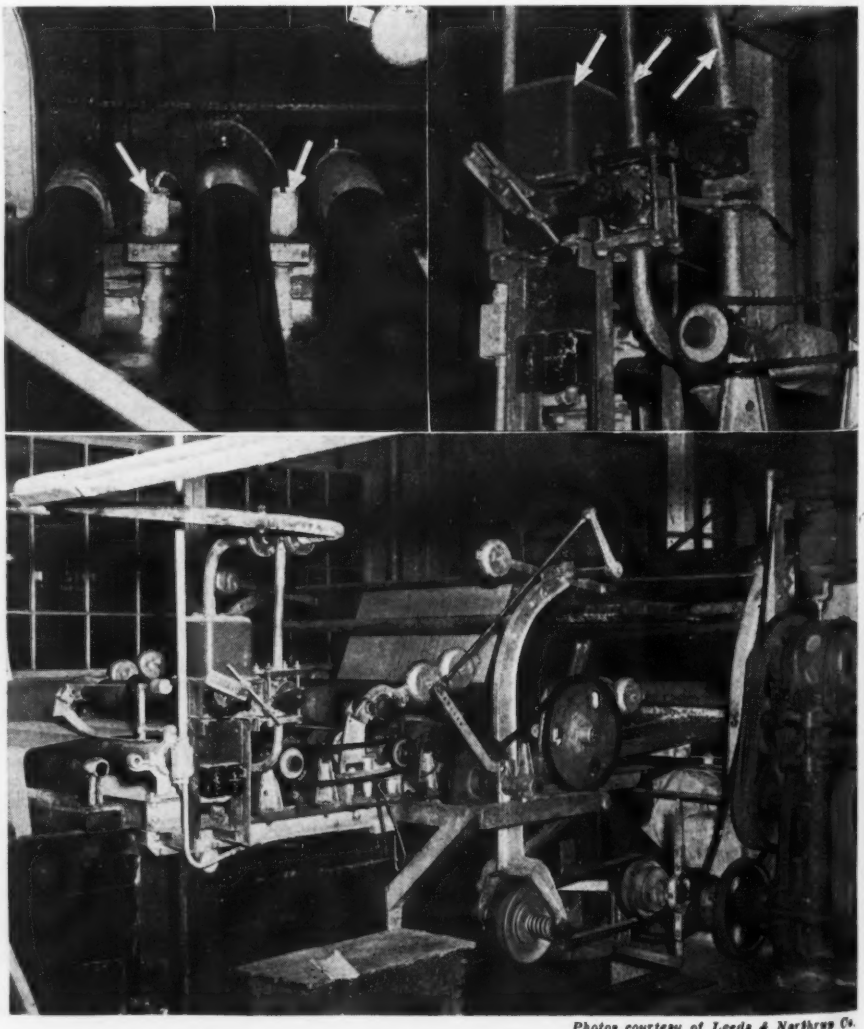
For piece-goods carbonizing Botany employs the sulphuric acid process. The acid bath is kept at the desired strength by running in concentrated sulphuric as needed. As manual methods of controlling acid concentration were not entirely satisfactory, it was decided to install Leeds & Northrup Micromatix automatic recording controllers. To date three James Hunter Machine Co. continuous carbonizing machines have been equipped with these instruments.

Essential parts of the controller are conductivity cells and automatic valve shown in the inserts. Instruments for indicating and recording the acid concentration in the three machines are illustrated in Fig. 2.

It will be noted that there are two conductivity cells mounted on the side of the acid box. At the lower end of each cell is a pair of gold electrodes. The electrodes in the measuring cell (at the right) are immersed in the carbonizing bath; those in the reference cell (at the left) are immersed in a sulphuric acid solution of the standard strength which is held in a cup. When the two cells are electrically connected to the Micromax controller, a 60-cycle current of minute amperage passes through the circuit. Whenever the concentration of the carbonizing bath changes from that of the standard solution, the conductance of the liquid also changes and the controller causes the acid valve to open or close as necessary to return the carbonizing bath to the proper concentration. The concentration is maintained to a tolerance of approximately $\pm 0.2°$ Be.

The indicating and recording instrument does not give direct readings of acid concentration of the carbonizing bath, but is calibrated in ratio. If the carbonizing bath is to be kept at 4° Be., a standard solution of 4° Be. acid is placed in the reference cell and the compensator dial on the instrument is adjusted until the recorder balances at 1.0 on the scale. By experiment, the operator can determine ratio readings for other concentrations.

Concentration of the carbonizing bath can be changed quickly by either one of two methods. Assume, for example, that it is desired to increase the strength from 4° to 4.5° Be. The first method is for the operator to turn the front-setting dial until the control point is at the proper ratio reading for a 4.5° Be. solution as previously determined by experiments. The other method, which requires just a few minutes, is for the operator to replace the 4° Be. standard solution in the reference cell with a 4.5° Be. solution and balance



Photos courtesy of Leeds & Northrup Co.

Fig. 1. Continuous carbonizing machine at Botany Worsted Mills equipped with Micromax control. Arrows show conductivity cells and automatically controlled acid-feed valve and acid lines.

the scale to 1.0 by turning the compensating dial inside the instrument. This latter method controlling acid concentration is seldom required.

The equipment requires very little attention. Once in each 8-hr. shift the measuring cell is lifted out and sloshed gently in the carbonizing bath to remove any lint or fibers which have deposited on it. The reference cell is removed only when the standard solution is changed or when the carbonizing bath is emptied. A hand-operated valve on the acid line permits by-passing of the automatic valve, and is very convenient when fresh baths are being mixed. The Micromax controller is of standard design and is of the same type that has been installed in cotton finishing plants for control of acid neutralizing baths employed for treating fabrics which have been mercerized with caustic soda.

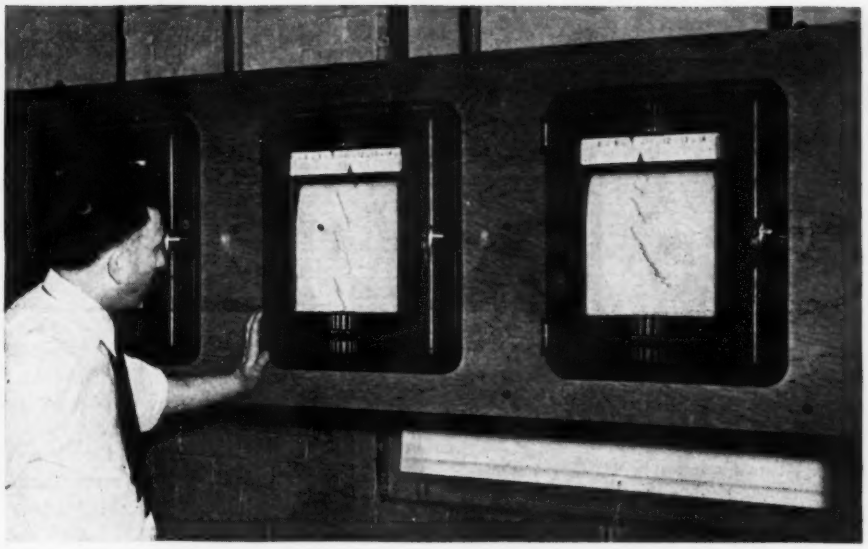


Fig. 2. Instruments give continuous record of acid concentration of carbonizing bath.

Varied-Staple Rayon

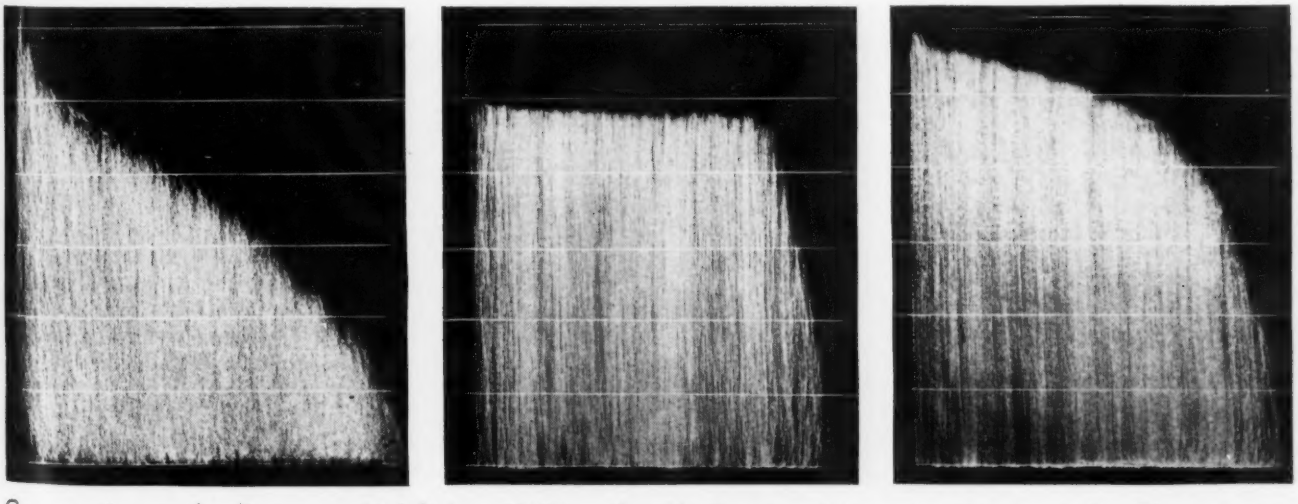
Has fiber diagram similar to worsted top

BRADFORD AND FRENCH SPINNERS may blend a varied-staple-length rayon, recently placed in commercial production by American Viscose Corp., with wool and still obtain approximately the same staple diagram for top as with 100% wool. This new Fibro varied-staple-length fiber differs from regular types in that each lot manufactured contains fibers that vary in length, instead of all being the same length. Fiber lengths are precision controlled so that there is a carefully calculated distribution of fibers of different lengths which closely resembles the distribution or "shoulder" found in natural wool tops.

The fiber is being offered in several varieties, as, for example, in lots in which the length of the fibers decline gradually and evenly from 6 to 3½ in., from 5 to 3½ in., and from 3 to 2½ in. In all other respects than its varied length of staple, the product is the same as standard viscose rayon staple fiber.

The resemblance between the diagram of a wool top and that produced by this type of rayon staple fiber is apparent in the accompanying photographs. The same characteristic sloping shoulder is found in both wool and rayon top diagrams.

The controlled varied staple length achieved in this product provides a blend of fiber lengths that complements those found in wool and is said to produce a more evenly spun yarn. It is said also to be a distinct aid in achieving a more thorough blending of the rayon fibers with the various wools with which they are used on the worsted system. An additional advantage cited for this development is that there are no overlength fibers to be broken in the drawing, and no underlength fibers to add to the noilage.



Comparative staple diagrams. At left is a 60/62s, oil-combed, worsted top; at center is regular Fibro top, 5.5 den., 5 in.; at right is the varied-staple-length Fibro, 5.5 den., ranging from 3½ in. to 6 in.

Serigraph Tests for Yarn Strength

Prove more reliable than skein or lea tests and merit general adoption

By GEORGE WEST,

American Thread Co.

Mill men depending on the accuracy of tests made in the laboratory for quality control of their product will find those suggestions made by Mr. West of value. Aside from obtaining more reliable results from serigraph tests, the author points out that considerable savings in yarns consumed in the testing laboratory may be made, especially where extensive testing is conducted.

CLOTH PRODUCERS are required to meet specified strengths for their products. In order to meet these strengths, they have had to resort to more yarn tests which is nearly always done by the skein or lea test. For several years our leading textile testing authorities have gone on record against the reliableness of skein testing, offering numerous reasons why it should be discarded. However, their findings and opinions have not been too widely distributed, and the manufacturers have been content to have their testing done in the same manner as did their predecessors.

It is surprising that men who can quickly perceive waste in the methods of manufacturing fail to see the waste in lea testing and understand that strength and elongation can be determined by a far more precise method. The assumption that breaking 80 loops (160 strands) at one time gives the average of the yarn strength when woven into a fabric is recognized by many today as being erroneous. It is thought, by many, that the skein test gives the average strength of the 80 loops, inasmuch as a strong loop tends to offset a weak one. This, also, has been proved a fallacy. Everyone who has had experience in a testing laboratory has met with the problem of having a customer demand a specified breaking strength per lea. It is difficult for such a person to consider these specifications seriously when one realizes the many variables which arise in this type of test. From thousands of tests made by the author, it was found that because of the great possibility of error, neither average elongation or strength was determined reliably.

Let us analyze the lea test thoroughly and establish a case history from start to finish, showing the ways that errors can be produced. First, let us investigate the reliableness for measuring elongation of lea tests. Two factors; namely, slippage of the yarn and varying lengths of the loops reeled play an important part in the elongation shown. These factors are of such importance that they should eliminate the use of the skein method for measuring the quantity of elongation, because it measures the evening out of the skein at the same time. This evening out will vary according to the tension variations in reeling.

Other errors are also found in skein tests. In our laboratories we have attempted to eliminate as much of the error in the skein test method as possible, and the results have been interesting. Some of these efforts are explained below.

The first possibility of being misled is in reeling. The reel must be absolutely true. The arms must not have a shorter periphery in the front than in the back of the reel. If they have, the loops of the test skein will vary. No matter how experienced the tester is, or the amount of caution he exercises in controlling the speed of reeling, the odds are high against his getting an even skein, even if the reel is true.

Committee D-13 of the American Society of Testing Materials has established directions for reeling, but these are for determining yarn size and are not intended to affect the yarn strength. Yet, we have found it is just as important to control the tension for strength tests as it is for size. The tension applied while reeling should control the delivery from the package. Variation of freedom in delivery from the test unit should be lost in the system of tension so that it is not carried through to the loops reeled. The tension applied must control the yarn as it is laid on the reel to prevent any loop from being tighter or slacker than the rest.

If the loops are of different lengths, the tight ones are the first to feel the stress during testing and are frequently stretched to their limit, reaching the point of breaking before the rest of the longer loops. It is not necessarily true that the weak strand breaks first, as many believe, but rather that the short or tight loop is the first one to rupture. But if a short loop is also a weak one, the skein collapses much sooner than it really should, whereas if the weak loops are long ones, the strength indicated by the test is higher. The ends, therefore, must be tied with care so that the loop formed by the ends will be of the same length as the others.

If we can overcome all these problems, we still have another in handling the skein in such a way as to transfer it from the reel, undisturbed, onto the breaking machine. This can only be done successfully through practice.

EXPERIMENTS carried out in our laboratories on the theory of evening out the yarn loops indicated that we were able to average a 6% increase in strength over the same yarn when tested according to the method prescribed by the A.S.T.M. Standards; that is, taking one turn around the guide. We also feel that when no effort is made to control tension, there will be some skeins with loops of even length, but the majority will have wide variations in the length of their loops.

The graph shown in Fig. 1 illustrates the increase in strength as yarn tension is applied, using the size-break constant for figuring the increase, as this allows for the size differences. We used an arrangement which would enable us to eliminate the wind variations and permit us to apply a low tension. Note from the graph how rapidly the percentage of increase climbs from one wrap around the guide to the point when 200 grains tension is applied to the yarn, whereas upward from 200 to 800 grains there is slight gain. This proves that when sufficient tension is applied to even the loops, little more can be gained by extra tension.

The greater skein strength showing is caused by more strands pulling at one time. However, no matter how carefully we tried, even when the reeling was controlled as stated, we seldom had the skein collapse all at one time. Nearly always a few strands would snap, soon followed by several more, until the skein had no further resistance. Each time one loop broke the load then had to be supported by that fewer number of loops. It was frequently observed that after the first few loops had broken, the skein would pull up 8 to

9% of its final breaking point. A real explanation of this action has never been made. One thing, however, which does appear certain, is that broken strands are another possibility of error. If it were possible to get all the strands pulling evenly and to break as one unit, we would get strength readings which would be close to the sum of the single-strand breaks, but it is impossible to accomplish this when the present methods of lea testing are used.

Naturally, this extra effort will show in the ultimate test result, and in a negative way. Therefore, inertia causes an error in lea testing which is larger than in other types of testing.

In lea tests one will find a great deal of inconsistency between yarn size and breaking strength. In making a physical test of yarn, we expect the breaking strength to compare with the yarn size. With a physical test, results will always show ruptures which have considerable

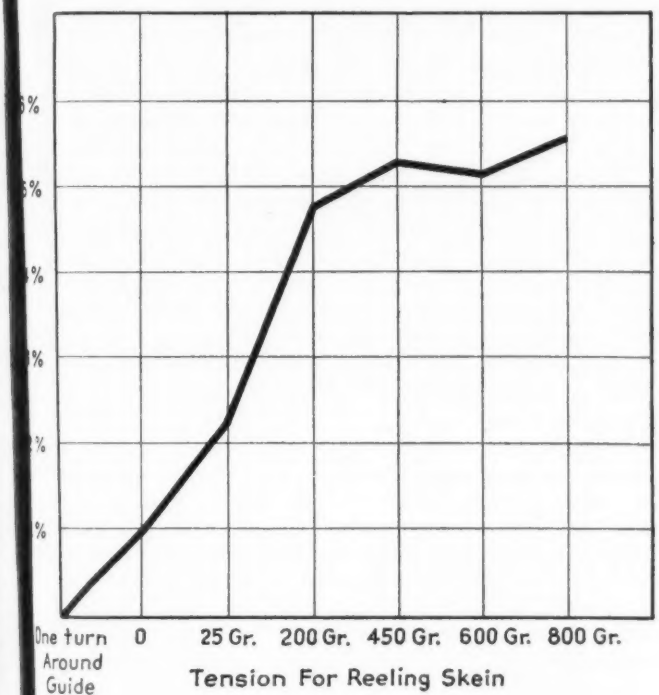


Fig. 1. Chart showing percentage of increase in breaking strength of cotton yarn skeined under increasing tensions. Tests were made on yarns ranging from 16s to 64s. Percentages shown are based on size-break constants.

SPEED OF APPLICATION of the load has been recognized for many years to be of tremendous importance to the breaking strength of cotton yarns and fabrics. The yarn or fabric tested will rupture at a higher number of pounds when the speed of the load application is a high one, whereas the opposite results are found when the speed of the pull is reduced. For this reason the speed of 12 in. per min. has been established in this country as the standard speed of the pulling jaw. However, although the pulling jaw is set for this speed, it is not carried through the test skein to the quadrant weight evenly. The skein, while under a slight tension, in trying to even itself out, slips, and the permanent stretch is pulled out. This evening is evident by having the quadrant weight move, then hesitate, then move forward, and hesitate again. This action is repeated until no more slippage or evening can take place. Although slippage is taking place when the quadrant weight hesitates, much more stress must be placed on the skein to move the quadrant weight forward. higher readings on the dial than skeins which are sizing a lot coarser. Experience shows that when the loops are even, caused by tension, the breaks are more nearly comparable to the yarn sizes and they do not show the large variations found in tests made without tension; that is, the high and low breaks are closer together and the entire range is in the higher strength brackets.

TWO GROUPS OF PEOPLE test the strength and elongation of cotton yarns. The first and largest group is made up of the cloth manufacturers, and the second and smaller group is the thread manufacturers. For the thread men the single-end test would be as reliable as any. This method could be used by the cloth men, but for them the better way would be to test by the serigraph method. This method is used by the rayon manufacturers to test the strength and elongation of their products. It was developed and recommended by the National Bureau of Standards (Research Paper No. 61) as an excellent way in which to test rayon yarns for strength and obtain very accurate results.

The National Bureau of Standards advises the reeling of 100 strands of yarn on a small reel or card winder, giving a small skein with a circumference of 6 or 7 in. for the serigraph test. The ends must not overlap, but must be laid evenly next to each other. The Bureau suggests also that the yarn be reeled under a slight tension. The strands should then be held in place with gummed tape and the skein cut from the reel. This is then broken on the testing machine with the jaws set 4 in. apart. It is surprising how much closer this break is to the sum of the single-strand breaks than is the break obtained using a lea skein.

It seems possible, when one studies the results, that instead of using 100 strands, as suggested by the Bureau of Standards, the cloth manufacturers could obtain a closer figure of the strength of the fabric by making serigraph tests with the same number of ends per inch as are contained in the cloth to which the yarn is intended.

In other words, if one is going to produce a cloth with 118 ends to the inch, then test 118 ends in the serigraph. Of course it will not give the exact strength of the fabric because of the interlacings and because the other strands in the fabric adjacent to the strands held by the clamp will help strengthen the sample. However, it is believed that this type of test will give a closer figure than does the skein test.

We have protested the quantity of yarn used in a lea test, especially when we can learn more from a test involving a shorter yarn length. A serigraph test uses much less yarn. If we use 100 strands of 6-in. lengths we use a total of 70 yd. for a four bobbin test. This makes a total of 18.200 yd. used in testing four bobbins over a period of one year. This figure, multiplied by the number of sets of four bobbins tested daily, will be much lower than the yards used in the same length of time with the lea method.

The serigraph test is not subject to the faults of the skein test. If the skein is reeled under a light tension and the ends are gummed, it is almost impossible to get an unreliable break. Each end has to pull evenly. There is little chance of the strands becoming crossed; there is no evening out of the strands; as there is no strand slippage, the elongation is reliable. Once the stress is applied to the yarn the quadrant weight does no hesitate, reducing the error of inertia which is present in a lea test. The quantity of yarns used in a serigraph test is much lower than that used in a lea test. In fact, it actually uses only one-sixth of the yarn of a lea test.

Tickle in Wool Knit Goods

A partial answer to the question of why some fabrics cause skin irritation

By ALDRED F. BARKER, F.T.I.
Emeritus Professor, University of Leeds

THE SUBJECT OF "TICKLE" may seem frivolous or even trivial. But to wool spinners and to knitters it is an important matter. There are many persons of both sexes who cannot wear wool next to the skin, owing to its tendency to cause tickle, which develops into an "itch" of an unpleasant and sometimes painful nature. The writer recently obtained samples of typical tickle and non-tickle knit goods. The tickle fabric when worn a few days next to the skin produced an almost painful itch—worse than a mere tickle. This was followed by the wearing of the non-tickle fabric and a return to comfort was effected in the course of two or three days.

It would appear that the skin of some individuals is much more liable to irritation than that of others, but it is also probable that any knit fabric which irritates a sensitive skin is not so comfortable to an in-sensitive skin as is a non-irritating fabric. Therefore, from every point of view, a knowledge of the several factors involved is of more than passing interest.

There appear to be three possible causes for tickle, each of which must be considered along with subsidiary causes. The first cause, to which most people attribute tickle, is simply and solely the wool fiber. Many people assert that they cannot wear wool next to the skin without developing an irritating rash. Cotton and linen, they declare, has no such effects on their skins. This point then is the first to be settled.—Is wool unique in causing tickle and may other fibers be absolved from giving rise to such a condition?

Other people state that they can wear wool next to the skin if the fiber is not too great in diameter; that is, if no coarse fibers are present. The best example of this condition which the writer has come across arose from an experiment in the manufacturing of musk ox fiber brought from the Arctic Circle by a noted explorer. The musk ox has a beautiful undercoat of fine fiber which it casts in the spring, and an outercoat of very coarse fiber which apparently is shed intermittently. It may be assumed that the soft undercoat would not tickle. In manufacturing, the difficulty is to separate the undercoat of fine fibers from the coarse outercoat fibers. Yarns were spun and socks knitted from the mixed fibers. So irritant were the coarse fibers that the socks knitted from this yarn were positively unwearable. It is not unfair to suggest that coarse wool fibers will cause a similar irritating effect. It is perhaps correct to say that fine wools, if contaminated with even a few coarse fibers, will tickle.

The third cause of tickle may be attributed to the coarseness of the knit-goods texture—possibly to some coincidence between the skin texture and the fabric texture. In addition to these three possible causes of tickle, there are other subsidiary causes which are revealed in the analyses of the two knit fabrics given in Table I.

If warmth is a factor in developing tickle, then the heavier cloth starts at a disadvantage. It is doubtful, however, whether warmth is a factor involved, and, if so, is of minor importance.

The structure of the respective yarns is quite a different matter. The yarn of the tickle fabric being composed of distinctive strands of wool and cotton, as shown in Fig. 1, may tend to develop uncontrolled wool fibers which may give rise to irritation. In a blended yarn, on the other hand, the wool fibers are so bound into the yarn and fabric that a smoother surface necessarily results, as illustrated in Fig. 2. If frictional electricity is a factor—and it may possibly be in dry climates—then the separate strands of wool and cotton are more likely to be influenced than those fibers of the blended yarn.

The respective extensions of the yarns involved hardly gives rise to any questions. It would seem that the natural tendency of the wool yarn to shrink more than the cotton yarn is controlled by the accompanying cotton yarn. But the surface fibers are obviously not controlled, as illustrated in Fig. 1 and as compared with Fig. 2.

Examining the wools employed, it is obvious from a cross-section of the tickle wool and the non-tickle wool that although there is a difference, this is not great. It seems to indicate that there are coarse fibers in both the tickle and the non-tickle yarns. The suggestion is made, however, that for wearing next to the skin no quality under a 64s should be used.

But, another question must be faced as to whether, for example, all 64s quality wools may be indiscriminately used. And, the answer is in the negative. Fiber diameter is not always a guide—there are qualities other than that of fineness involved. Thus, not only must 64s and other qualities be selected, but soft, silky types must also be used. In fact, it may be stated that rather than wools of the down type, with "life," more plastic wools with less life should be employed. Those persons who say that they cannot wear wool usually wear products knit of Egyptian cotton, which is, by no means, remarkable for "life."

The twist of the yarns employed is important. Two points are involved. First is the problem of absolute twist. If a soft, knitting wool is employed, then the slacker the twist, the better

TABLE I—ANALYSIS OF TICKLE AND NON-TICKLE KNIT FABRICS

Items	Tickle Fabric	Non-Tickle Fabric
Weight per sq. yd	9 oz.	6 oz.
Wales per in. (untensioned)	19	30
Courses per in. (untensioned)	48	84
Counts of yarn: Wool:	22s Wstd.	Wool & Cotton: 30s Wstd.
Counts of yarn: Cotton:	19s Wstd. } 10s Wstd.	
Extension: Wool:	370%	Wool & Cotton: 360%
Extension: Cotton:	370%	
Quality of wool	60/64s	64s
Average wool fiber dia	1/1080 in.	1/1125 in.
Twist: Wool:	17 t.p.i.	15 t.p.i.
Twist: Cotton:	15 t.p.i. } 15 t.p.i.	
Approximate percentage of cotton	50%	50%

Note: The wool and the cotton yarns in the tickle fabric are twisted in opposite directions.

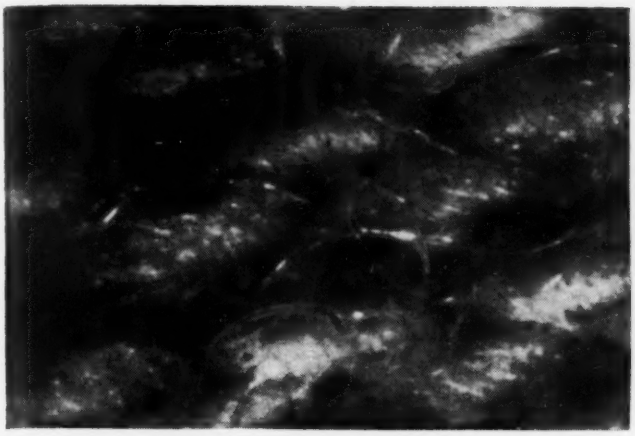


Fig. 1. Photomicrograph showing skin side of knit goods that irritated wearer.

Fig. 2. Skin side of the knit fabric used in this test which did not irritate the wearer.

it is. On the other hand, if there are coarse fibers in the wool selected, it is conceivable that more twist will bind better these strong fibers into the yarn. But, coarse fibers always tend to rise to the surface—hence they should be avoided whenever possible. The second point, which arises only with reference to a fabric composed of cotton and wool yarns, is direction of twist. If the two directions are the same, the cotton and wool strands will tend to bed or sink into one another, to a certain extent, whereas they will tend to repel one another if in opposite directions.

Finally, the problem of an all-wool, wool and cotton, or an all-cotton yarn must be considered. From these two examples, it would seem that cotton cannot prevent tickle if it be used with a wool which tends to tickle or if it is used in such a way that it does not satisfactorily control the wool fibers with which it is associated.

Care was taken to eliminate any influence of laundering in the studies made on this problem. The two fabrics have been laundered several times in precisely the same manner, so that it is fair to assume that any differences there may be must be looked for in the structure—fiber, yarn, or fabric.

SUGGESTED EXPERIMENTS. As the literature on this subject of tickle is very limited and our knowledge of the factors involved also is limited, it is suggested that a series of experiments along the following lines should be conducted.

1. This experiment refers principally to the weight of fabric. It is possible that fabric warmth may be one of the causes of tickle. To test this, individuals particularly sensitive to tickle would be selected to wear three or four fabrics of different weights made from a known non-tickle yarn in a non-tickle structure. It may be impossible to obtain these different weights of fabric without varying the thickness of yarn; hence it may be possible to make the next test at the same time.

2. Tests for tickle ply yarns of wool and cotton against a blended yarn could be made as follows: A standard knit fabric of medium weight should be selected and exactly the same weight of fabric produced with the two respective yarns. For this purpose a 30s wool yarn (worsted count) and a 20s cotton yarn should be plied together for one fabric and a 15s blended yarn (worsted count) used for the other fabric. All the processes through which the respective fabrics pass should be similar in every respect.

3. With reference to wool qualities it would seem that for knit fabrics to be worn next to the skin no lower quality than a good 64s should be used. But, it is obvious that quality as defined by average fiber diameter is not sufficiently explicit. To obviate tickle it appears essential that there should be no really coarse fibers in the blend. For example—

Sample	Quality	Average fiber dia.	Coarsest fiber dia.
A	64s	1/1100 in.	1/1000 in.
B	64s	1/1150 in.	1/900 in.

Of these two qualities *A* will probably be much the better, although *B* has a finer average fiber diameter. Tests to prove or disprove this assumption are needed.

4. If a two-ply yarn is to be used, the spinning of the two yarns must be much finer than when a single yarn is employed. This point, however, is not so important as appears on first consideration, since for non-tickle goods a fine-quality wool must be used—a 64s quality should spin to any count required. In spinning toward the limit for extremely fine yarns, however, more twist is certain to be suggested. In the wool yarn used in the tickle fabric tested an angle of 27° is employed; and this is the angle for the greatest strength.

It would seem desirable to carry out two distinct tests. First, a test purely on twist should be conducted. A 15s worsted yarn might be spun with twist angles of 15° (7 t.p.i.), 20° (9½ t.p.i.), and 25° (12½ t.p.i.), and knit fabrics of exactly the same construction made from each yarn.

With fabrics made with plied wool and cotton yarns, both similar and reverse twists should be tried. As already suggested, it seems probable that twists in the same direction will bed better than twists in opposite directions, as in the tickle fabric under investigation.

6. Tests should be made to determine how far the blending of cotton with wool will suppress tickle. To investigate this subject thoroughly at least three blends of wool and cotton must be made, as well as pure wool and pure cotton yarns added to the series. A series suggested is given in the following table:

Sample	1	2	3	4	5
Wool...	All-wool	75%	50%	25%	
Cotton..		25%	50%	75%	100%

Investigation of the problem will reveal other factors involved in tickle of wool and suggest further tests which should be made. For example, two factors not mentioned above are the electrical properties of the wool and the effect of treating the fibers, yarns, or fabrics with chemicals to counteract tickle. Also the plating of cotton on a worsted, or worsted on a cotton, fabric with the cotton face used next to the skin is another means of bringing comfort to the ticklish.

Characteristics of Nylon Yarn

Test for measuring chemical damage also sheds new light on fiber properties

NYLON, in common with all other textile fibers, can be damaged by exposure to various chemicals, light, and heat. Experiments carried out in the laboratories of Courtaulds, Ltd., and British Nylon Spinners, Ltd., indicated that acid solutions will probably be employed widely in dyeing of Nylon, and that mineral acid attack is a frequent cause of textile damage. A fluidity method for estimating chemical damage was developed, which is believed to be useful for control work and which has shed some new light on the properties of Nylon. The method of carrying out the test and some test results are described by J. Boulton and D. L. C. Jackson, in the February issue of the *Journal of the Society of Dyers & Colourists.*

Briefly, the test consists of measuring the fluidity of 8% solutions of Nylon in M-cresol, using a viscometer similar to that employed for determining the fluidity of cotton and other cellulose solutions. Moisture regain of Nylon over a range of relative humidities is given in Table I. For the tests Nylon was conditioned 65% r.h.

It was found that the fluidities ranged from about 20 for undamaged Nylon to about 40 for badly damaged yarn. (Fluidity number = reciprocal poises × 100). It was discovered also that exposure of Nylon to the action of *N* sulphuric acid resulted in an increase of fluidity and a corresponding loss in tensile strength and a decrease in extensibility. Results of tests on 14-den., 15-fil., dull Nylon treated with *N* sulphuric acid at various temperatures and lengths of time are shown in Table II.

Results of exposure of bright and dull Nylon in a Type FDA Fade-Ometer for periods of 8 to 168 hr. are shown in Table III. It will be noted that there is smooth relationship between rising fluidity and increasing degradation as measured by tensile strength. Extensibility also falls progressively with rising fluidity. It will be noted also that dull Nylon is degraded at a rather higher rate than bright Nylon; that is, the dulling agent appears to promote degradation to an appreciable degree.

Comparison of test results as given in Tables II and III shows that the rise in fluidity for a given loss of strength produced by acid attack is approximately twice that for the same loss of strength produced by exposure in the Fade-Ometer.

Table I. Moisture regain of Nylon

Relative Humidity	*Regain*
40%	2.9%
50	3.4
60	3.9
65	4.2
70	4.7
72	4.8
80	5.5

Table II. Effect of *N* sulphuric acid on fluidity, breaking strength, and elongation of Nylon.

Temperature of Treatment	Time of Treatment	Fluidity	Breaking Strength	% Extensibility	% Loss of Strength
Untreated		21.6	221	18.5	....
90°C.	5 min.	24.7	212	23.0	4.5
90°C.	20 min.	26.0	203	21.3	8.2
90°C.	40 min.	25.6	205	24.0	7.2
90°C.	1 hr.	29.9	193	18.0	13.0
90°C.	3 hr.	32.6	186	16.0	16.0
90°C.	5 hr.	38.8	165	14.0	25.0
90°C.	6 hr.	40.6	166	19.0	25.0
90°C.	7 hr.	44.9	152	13.0	31.0
90°C.	9 hr.	47.7	146	16.5	34.0
90°C.	12 hr.	50.9	120	11.0	46.0
Room	1 hr.	26.1	209	19.5	5.4
40°C.	16 hr.	26.4	210	19.5	5.1

Table III. Effect of exposure in Fade-Ometer on fluidity, breaking strength, and elongation of Nylon.

	Time of Exposure (hr.)	Fluidity *F*	Strength Breaking Load in g.	% Extensibility	% Loss of Strength
Bright Nylon 43/17 Scoured	Unexposed	20.6	257	20.5	....
	8	22.3	249	20.5	3.1
	20	23.0	249	19.5	3.1
	48	24.9	235	18.0	8.6
	96	28.3	169	13.5	31.0
	168	33.3	149	13.0	42.0
Bright Nylon 43/17 Unscoured	Unexposed	20.8	259	18.0	....
	8	21.9	255	16.5	1.9
	20	23.5	242	16.5	6.9
	48	25.6	228	15.0	12.3
	96	31.2	180	11.5	30.8
	168	40.4	107	10.0	59.0
Dull Nylon 45/15 Scoured	Unexposed	21.9	230	37.0	....
	8	22.1	221	22.0	3.9
	20	23.7	200	18.0	13.0
	48	28.0	178	13.5	22.0
	96	29.0	169	12.5	30.0
	168	41.3	71	7.0	60.0

Imperfections in Woven Fabrics

Definitions and cause, for defects traceable to the weave room

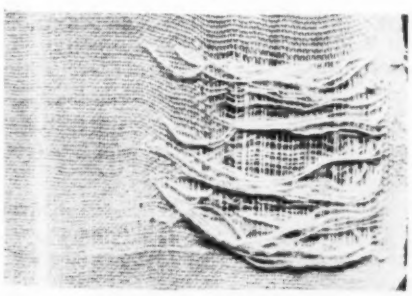
Articles illustrating fabric defects have appeared in the March and June, 1939, May and November, 1940, May 1941, and August 1942, issues of TEXTILE WORLD. Illustrations and definitions of the first 16 defects, those presented in the March, 1939, article, have been included in the "Glossary of Textile Terms Relating to Textile Materials," issued by Committee D-13 ASTM. Those imperfections illustrated and defined in the later series are now being considered for inclusion in the glossary. In addition, the Army Quartermaster Corps has ordered several hundred reprints of the entire series for use in training field inspectors, and many reprints have been sent to mills at their request for use in training courses and instructing employees.

By THOMAS NELSON
Dean of the Textile School
North Carolina State College

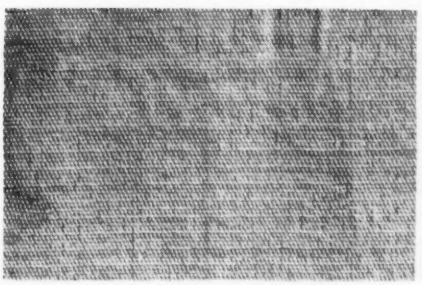
WEAVERS are constantly permitting their looms to produce defective material without knowing that such defects are being woven into the cloth. Education of weave-room overseers, cloth-room overseers, second hands and weavers in the recognition, the causes and the remedy of cloth defects will do much towards reducing the amount of seconds produced. A standard system of nomenclature should be adapted for identifying defects so all departments will agree as to identification, thus preventing confusion and loss of time in checking.

Looms in which certain cloth imperfections appear frequently should be checked by the loomfixer to determine if it is adjusted or set properly. If, after proper repair the looms still produce defective fabrics, then both the loom and the operative should be observed closely. Sometimes the operative may, although not recognizing the seriousness of his action, be causing the defect.

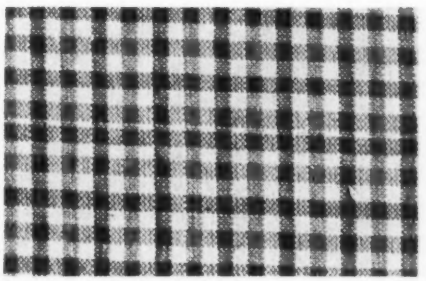
Whereas the defects illustrated apply to cotton fabrics, many of them will also constitute defects in rayon fabrics and in some instances appear in woolen and worsted cloths.



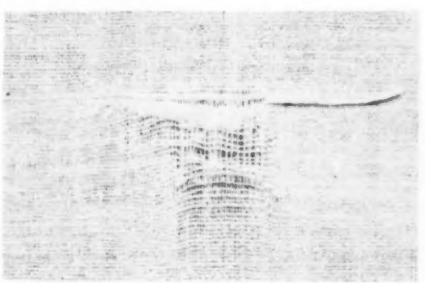
Floats, Near Selvage—*Appearance:* Warp ends and filling picks floating on the cloth near the selvages. *Cause:* Broken selvage ends entangling in the warp results in floats near the selvages of the cloth.



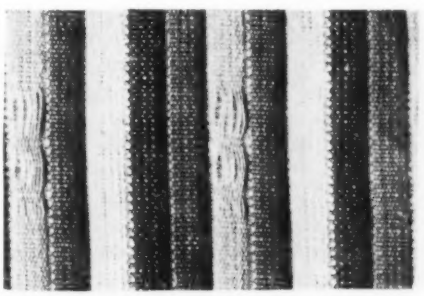
One Way Filling in Crepe—*Appearance:* Filling with only one direction of twist where there should be picks of S twist and Z twist alternating. *Causes:* The filling of one twist has broken or run off the bobbin. The filling stop motion did not stop the loom at filling break.



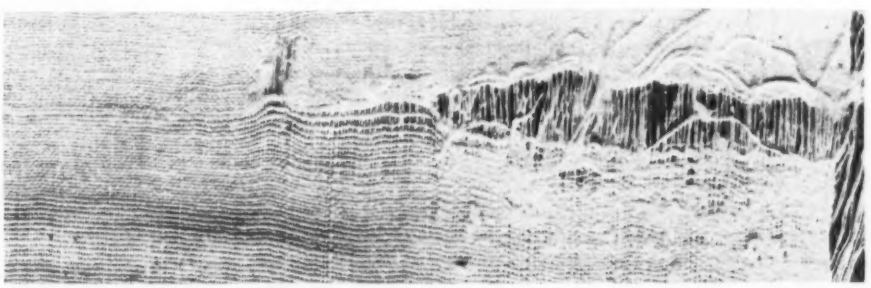
Double Pick—*Appearance:* Narrow rib of two picks in same shed running across the fabric. *Cause:* Filling bunch on quill not made correctly, filling feeler not working, weaver not catching pick after loom stops for filling break and double end wound on bobbin.



Floats—*Appearance:* Warp ends and filling picks floating on the cloth create a section without interlacings of the yarns. *Cause:* Drawback of warp ends causes them to break and become entangled in the warp.



Jack Hook Binding—*Appearance:* Warp ends float on the face of the fabric. *Cause:* Peg in the dobby chain bent or not in the correct position to control the warp end will result in warp floats. Check chain and straighten or replace peg.



Open Place at Side of Fabric—*Appearance:* Picks spread apart showing a wide bar for several inches at side of fabric. *Cause:* Operative pulled back the temple from the fell of the cloth.

Cotton Research Plan Described

THE ANNOUNCEMENT that cooperative research by the cotton textile industry has already been started by a group of 20 textile executives was the highlight of the annual convention of the American Cotton Manufacturers' Association at the Atlanta Biltmore, April 30. Other important subjects were aired in addresses at a luncheon meeting by Herman Cone, ACMA's retiring president, and Dr. Claudius T. Murchison, president of the Cotton Textile Institute. Mr. Cone was presented with a silver tray and goblet in appreciation of his services, and Wm. M. McLaurine, secretary-treasurer, was given a complete silver service in recognition of his 17 years of service to the organization.

Fuller E. Callaway, Jr., announced that 20 textile executives have banded together to put a cooperative textile research program into effect as promptly as possible. The maximum cost should not exceed 10¢ per spindle or 25¢ per bale of cotton consumed per year whichever of these two calculations figures higher for a particular mill.

Mr. Callaway pointed out the danger of losing national markets to industries such as chemical, paper, and steel which are conducting research to develop substitutes for cotton materials now in common use. The market served by textiles is quite a "plum" and many industries have their eyes upon it, he said. "Textile machinery is only about 20% as efficient as a modern airplane engine," he went on. "By making full use of modern science, we can improve cotton-textile machinery to such an extent that it will no longer be a determining factor in the location of our own cotton industry thus eliminating the necessity for the textile industry to migrate to South America, China, Japan or India to reach cheap labor. The machinery builders have done a fine job in many respects; nevertheless, I believe you will agree that the textile machinery in our mills today is tremendously wasteful of labor compared with the modern machinery employed in many other industries."

Mr. Cone outlined the accomplishments of the cotton-textile industry for the past year, pointing out the recognition of those accomplishments by the Government procurement agencies. Although textiles rank next to steel in production of necessary war equipment, said Mr. Cone, the Government has had to spend little if anything to equip textile plants. "We haven't needed Government intervention or help," he went on. "The textile industry is self-sufficient, self-supporting and self-reliant. No one in our industry has asked the Government to build a mill; no one asked the nation or taxpayers to carry raw materials for us. The accomplishments that we are proud of have been achieved for the most part by the wholehearted cooperation of management and labor."

Dr. Murchison reviewed the causes of decreasing manufacturing margins which are rendering some mills unable to cover costs. When the sliding scale of cotton goods prices was abandoned, gray goods prices were frozen on the basis of 20.37¢ cotton. Recently the CCC announced that it was taking steps to prevent cotton from rising above an average spot basis of 21.38¢. The advance in cotton prices and increased labor costs, along with a cut in the ceiling prices of 10s single cones, have reduced the margin on this number lower than at any time since March 1941, at which time the average weekly wages were 40.6¢ an hour as compared with 55.5¢ at the end of 1942.

Hugh M. Comer of Avondale Mills, Sylacauga, Ala., was elected president; J. A. Chapman, Inman (S. C.) Mills, first vice-president; W. Harrison Hightower, Thomaston (Ga.) Cotton Mills, second vice-president; and W. M. McLaurine, of Charlotte, N. C., was re-elected secretary and treasurer.

Biggest Outerwear Gathering

THE NATIONAL KNITTED OUTERWEAR ASSOCIATION held its annual meeting in New York on April 8. It was followed by a dinner which drew the record-breaking throng of 1200, the largest in the 25 years experience of the association. A. Paul Cohen, Suffolk Knitting Co., was elected president, succeeding Rudolph Wyner of Shawmut Woolen Mills, who has served two terms.

Speakers from Government agencies, military service and industry discussed the effect of wartime restrictions and praised the outerwear industry for efficiently producing materials essential in military clothing and to civilian life.

Major General Clifford L. Corbin, Assistant Quartermaster General and Chief of Supply, United States Army, in speaking at the dinner, stated that since the beginning of the national emergency, the association had cooperated to the fullest with the armed services and the Quartermaster Corps.

Henry V. Hermann, General Dyestuff Corp., compared the situation with regard to dyestuffs and chemicals in World War I and the present conflict. He said the industry was now in a good position to meet requirements and that the war "has not reduced nor threatened to reduce the quality of dyestuffs."

The procedures and work of the Philadelphia Quartermaster Depot was described by Captain Robert R. Spillman, Contracting Officer for Women's Garments, and Captain John M. Gibbons, Contracting Officer for Knit Goods.

Arthur Besse, National Association of Wool Manufacturers, warned of the difficulties to be encountered in the execution of a simplification program which was too rigid and failed to allow for restrictions on wool available for civilian purposes so that this amount could be used to the best advantage.

The National Knitted Outerwear Association's drive to raise funds to purchase a bomber of the Flying Fortress type was concluded at the dinner with a total of over $426,075.

Hosiery Conference Tackles Problems

THE 39TH ANNUAL MEETING of the National Association of Hosiery Manufacturers in New York on the morning of April 16 prefaced the annual conference of the hosiery industry sponsored by that association and three other associations, and held on the afternoon of that day and the morning of the next. Except for the association's annual meeting, the sessions were executive and devoted to group discussions.

I. K. Hessberg, whose two terms as chairman of the board of NAHM did not make him eligible for reelection, was succeeded in office by J. J. Kronenberg of Wayne Knitting Mills. Mr. Hessberg spoke briefly in opening the meeting on the value to the industry of Washington-representation by a virile association. Earl Constantine, reelected president, covered the numerous aspects of the association's work in his annual report. MPR 339 came in for considerable mention both at the annual meeting and at the conference which followed. Mr. Constantine said in part:

"The Government handling of the allocation of rayon yarns to our industry has been efficient and practical. There is a general satisfaction through-

out our industry, although some provisions and some policies have been onerous on some of our manufacturers, and some hardships have been suffered.

"In 1940 the hosiery industry consumed only 16,400,000 lb. of rayon yarn principally in half-hose and other seamless. In 1941, as the result of the embargo on raw silk which went into effect near the end of July, our industry consumed 26,300,000 lb. of rayon yarns. In 1942 our consumption had increased to 49,300,000 lb., making us a substantial user of such yarns. During the last year the manufacturers of women's hosiery have developed an excellent product which will principally supply the hosiery needs of women for the duration.

"The committee representing manufacturers of women's hosiery was active until the recent issuance of price regulation MPR-339 to govern women's rayon hosiery. The experiences of this committee were very unsatisfactory during the more recent months when they encountered a policy and philosophy among the economists and lawyers of OPA which disregarded to a great extent the practical realities involved. OPA's order MPR-339 of March 8 prescribing ceilings on women's rayon hosiery, proved to be unduly and inexcusably complex, impractical and inadequate.

"Since June 1940, when our Government initiated its defense program, our industry has supplied the armed forces and the Lend-Lease Administration approximately 358,000,000 pairs of hose."

Wool Men Foresee Ample Civil Goods

A WORTHY RECORD of wartime accomplishment was laid before the membership of the National Association of Wool Manufacturers at the annual meeting in New York April 14, and plans were made for meeting the problems of the future. Arthur Besse, president, put his finger on the more important of these in his annual address.

He said, "Military requirements are somewhat tapering off. As a consequence it would appear possible to increase the production of civilian products. With only a small amount of help from the agencies of the Government we can produce enough to clothe our own population adequately so that no rationing of wool clothing should be required. The only thing that might prevent would be the purchase by the Government of large quantities of wool fabrics for foreign relief.

"The apparent prevalence in Washington of the idea that 'simplification' or 'regimentation' of product is an easy method of securing an increase in production has an important bearing on the future of our industry. Some industries lend themselves to simplification; others do not. The wool-textile industry is in the latter class. It is not a standardized industry either as respects its raw material, its manufacturing processes and technique, or its end products. Individual mills have already reduced the number of their particular products, thereby increasing their own production. A reduction in the type and number of products made by a single mill is, however, far different from an attempt to reduce and standardize the products of an entire industry. Such an attempt cannot fail to require changes in the methods of those who do not fit the mold made for the standardized product. This produces artificial bottlenecks.

"Another cloud on the horizon is the insistence of the State Department that the so-called Reciprocal Trade Agreements be renewed for a further period. These treaties, which first were to banish domestic depression, then were to avert international rivalry and war, are now billed as the hope of the world in the post-war struggle for economic security. We can have no sense of security in our industry so long as the State Department insists on reductions in our import duties in an attempt to find means of forcing a greater volume of post-war exports.

"The year of 1942 in wool textiles was remarkable in that it set production records which are a new all-time high and one not likely to be reached again for many years to come. Wool put into process during 1942 totaled 560,000,000 lb., scoured basis, more than 2.1 times the average of 265,500,000 lb. for the 10-year period 1931 to 1940. The output of apparel fabrics in 1942 rose to around 450,000,000 linear yards or 60% greater than the 282,000,000 average for 1931 to 1940. In addition 107,000,000 lb. of worsted knitting yarns were produced in 1942, an amount almost 2.5 times the average for the six prewar years."

Arthur Besse was reelected president for the ensuing year, and Walter Humphreys secretary-treasurer. The following vice-presidents were elected: Franklin W. Hobbs, Moses Pendleton, Frank J. Payan, Abbot Stevens, E. Dean Walen.

Manpower Discussed by Alabamans

MILLS MUST TURN to older men and to an even larger number of women employees if they are to continue to operate at the present rate after the War Manpower Commission gets its program under way, according to Dr. C. T. Murchison, president of Cotton Textile Institute, speaking before the annual meeting of Alabama Cotton Manufacturers Association in Birmingham April 16. The armed forces will be rapidly built up to a total strength of 11 million men, he said, and the mills will be left with not more than 40% of their present employees of 18 to 38 age. Dr. Murchison suggested the possible use of a split-shift of 4 hours to permit use of women with household duties.

Renegotiation of contracts is still a major problem, according to Dr. Murchison. The recent Truman Committee report was sensational, he said, and gave impetus to the movement to modify this law. He expects some legislative relief within a few months.

J. Craig Smith, retiring president of the association, and vice-president and treasurer of Avondale Mills, in his opening address said: "At our last annual meeting Ben Russell suggested the slogan, 'Utmost Production for Victory.' The record of the textile industry in Alabama during the last year entitles us to the slogan's continued use. During this period there has not been one mill that has closed for one hour because of any type of labor dispute."

Brief reports were received from chairmen of the various committees set up by the association, namely: Cotton Committee, H. H. Greene; Traffic Committee, R. L. Murphy; Legislative Committee, C. M. Elrod; Textile Operating Executives Division, A. R. Macormac; Office Executives Division, W. D. Megahee; Resolutions Committee, Comer Jennings. These reports were brief and condensed in keeping with the streamlined plans of the new secretary, Ed. C. Langham.

The Alabama State-Wide Safety Contest was won by Merrimac Mfg. Co., with Russell Mfg. Co. in a close second place for the weaving and spinning mills; and for spinning only, Boaz Mills won, with Adelaide Mills second.

Officers elected for the coming year are D. H. Morris, Jr., president; George S. Elliott, vice-president; J. T. Phillips, treasurer. J. Craig Smith was elected chairman of the board and the following new board members were named: Comer Jennings, Fred O. Tyler, W. E. Hendricks and Frank B. Williams.

LOOMFIXERS' MANUAL

WOOL SECTION—Chapter XV (Continued)—Lay Motions

By EUGENE P. SCHREMP

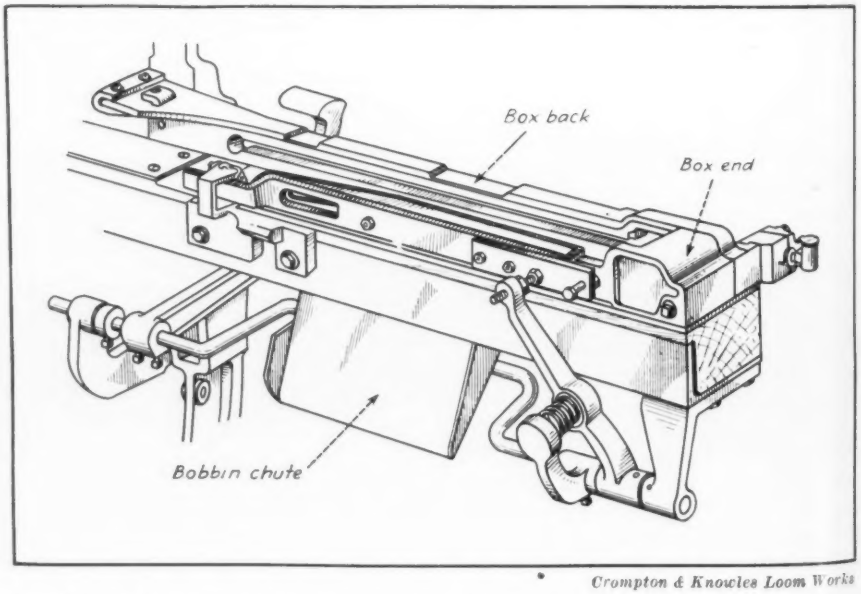
RACE PLATES are constructed of steel or of hard wood such as maple. Wooden race plates wear uneven at the ends and must be replaced frequently; otherwise the shuttle will not be thrown straight. Screws holding the race plate to the lay must be counter sunk so that there is no danger of the warp ends coming in contact with the heads of the screws. Race plates are usually covered with cloth by the loomfixers to help prevent the shuttle from breaking the warp ends. Small wire brads driven into the front of the lay about 4 in. apart with the heads extending ½-in. outward will hold the cloth and can be left there permanently. If tacks are used they must be pulled out and replaced when the cloth is renewed and in a short time the wooden strip on the lay will be damaged. The cloth covering should not extend beyond the edges of the fabric being woven, as it may roll up and interfere with the shuttle. It should also be cut wide enough to extend a few inches below the back of the lay so that there is no danger of it rolling behind the reed and lifting the lowered warp ends. Waste accumulating behind the reed should be removed or the same trouble will result. Usually, it is not necessary to cover the race plate with cloth when weaving heavy or coarse woolens.

Correct alignment of the lay is very important. The lay must be level and parallel with the breast beam. Most woolen and worsted looms have adjustable crank connectors. To adjust the lay to a parallel position, have the lay at front center and lengthen or shorten the crank connectors so that there is 5¼ in. between the inside edge of the breast beam and the reed line at each end of the lay. At front center, the lay should be ⅛ in. lower than the breast beam. Slots in the lay sword feet permit the lay to be raised or lowered by the adjusting screw. If lock nuts on the adjusting screw and the bolts holding the feet to the lay sword are allowed to loosen the lay will have a tendency to lift. This will throw a number of motions such as magazine, detector, protector and others out of adjustment.

When a loom has run for a number of years the rocker shaft or the bushing in the loom side may become worn and allow the lay to drop out of position. Wear in these parts can be checked by using an old picker stick as a lever to raise the lay ends. If there is too much play the rocker shaft should be removed and checked for wear. Bushings in the loom side should also be checked and replaced if worn. Some fixers make a practice of turning the rocker shaft so that the worn part will come in a different place but this method is not recommended. Proper lubrication will help prevent these parts from wearing. When replacing a lay sword or foot, spacing washers are sometimes used between the loom side and lay sword foot. All play at this point should be removed, but the lay sword should never be forced in place. Doing so, will cause the lay to lift at the middle and throw the lay ends out of line.

Reed alignment is very important, as the reed must be square with the race plate and line up with the box backs. Reeds vary in thickness and each reed should be checked when installed. Adjusting screws should be so set that the reed does not come in contact with the race plate at any point as it will throw the wire dents of the reed out of alignment and may cause reed marks in the fabric. This clearance between the race plate and reed should be less than ⅛-in. The hand rail should rest slightly on the reed and not be hammered down as this will distort the reed. On the drop-box side a shuttle guide is used to prevent the shuttle from lifting as it enters the box. This should be set about ¼-in. above the top of the shuttle.

A plain lay end as used on C & K, 4 x 1, Automatic W-2 and W-3 looms is illustrated in Fig. W32. Proper alignment of the box back is necessary to insure a straight thrown shuttle. The box back should be adjusted so that when a 48-in. straight edge is pressed tightly against the box back the end will project ⅜ in. into the reed line. Correct adjustment is made by loosening the two capscrews at the end of the lay, which hold the box back and box end, and by moving the unit to the desired position. These capscrews should be kept well tightened at all times. Picker rods must be perfectly straight and in line with the picker slide.



Crompton & Knowles Loom Works

Fig. W32. Plain end of lay showing box front of C & K, W-2 and W-3 looms.

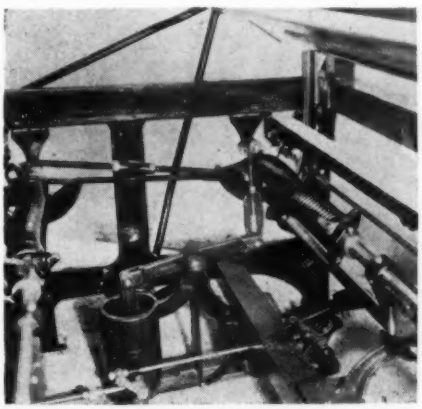
TEXTILE EQUIPMENT NEWS

Sample Dryer

Drying and conditioning of sample swatches of cloth in 1½ min. for a worsted suiting and 3½ min. for a 34-oz. Army melton are possible in the Whirlwind Sample Dryer, developed by Rodney Hunt Machine Co., Orange, Mass.

The process which includes both the drying and conditioning of samples, is basically one of rotating the samples at high speeds, first in a dryer cabinet and then in the room at normal temperature and humidity. The samples are placed on wire screens on a disc or rotor which is attached to the inside of the door of an insulated cabinet. The door is closed, the motor turned on, and the samples rotate inside the cabinet at great speed, building up an effective air velocity of approximately 6,000 ft. per min. This forces air under great pressure directly through the cloth, thus giving phenomenal drying speed. After the sample is dried, the door of the cabinet is opened and the sample continues to rotate at room temperature and humidity until conditioned properly.

It is stated that this represents a great improvement over the conventional way to dry samples in a textile mill over a steam pipe or by a hair dryer. More accurate matching of samples by the dyer is permitted as little time is lost in drying a sample. If 10 to 20 min. are required for drying, as with the old method, the cloth in the dye kettle has a chance to change shade, lessening the accuracy of the match.



Air lift for table of folding machines (Curtis & Marble)

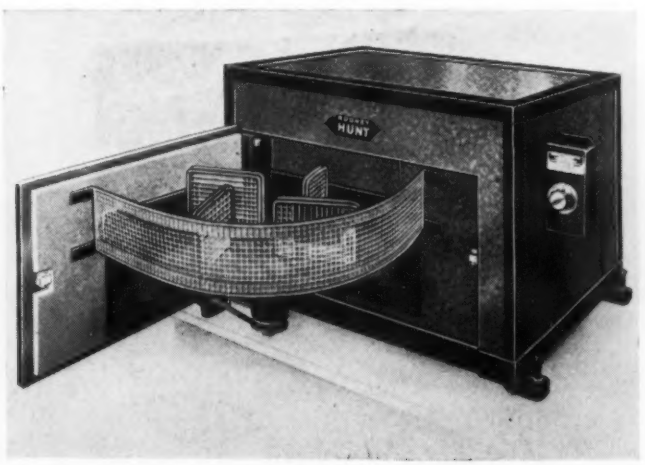
Air Lift for Folding Machines

Designed to replace the regular foot treadle on folding machines and to relieve the operator from the fatigue caused by raising and lowering the table of the folder, the Lewis air lift introduced some time ago by Curtis & Marble Machine Co., Worcester, Mass., is now rapidly gaining in popularity as a result of the shortage of manpower and the consequent employment of women for operating folding machines in gray goods mills and finishing plants. The Lewis air lift has a treadle which is similarly placed to the usual foot treadle on the folder. A light touch of the operator's foot opens and closes the valve. The lift does not interfere with the operation of the folder otherwise. This air lift can be attached to the regular Curtis & Marble or Elliot & Hall cloth folding machines. It is made in two different sizes. A 4-in. diameter cylinder is used where an air pressure of 40 to 50 lb. is available and a 5-in. diameter cylinder is used for lower pressures. Where compressed air is not available in cloth rooms, it may be supplied by a separate compressor.

Electronic Adjustable-Speed Drive

For application on industrial drives, a new electronic adjustable-speed drive, is announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Known as the Mot-O-Trol, the new drive provides speed regulation over a 20 to 1 speed range for d-c motors operating from an a-c source. Among textile applications suggested are on warpers, winders, starch mangles, padders, sanforizers, and other equipment where constant linear speed at uniform ten-

Wet samples are placed in the cages, the door closed, and the samples rotate at high speeds and under air pressure



Samples are conditioned by opening the door of the cabinet and rotating the samples in the room atmosphere (Rodney Hunt)

sion or wide speed range where close regulation is required.

Features of the electronic drive include stepless speed control, automatic close-speed regulation over wide load fluctuations, full torque at extremely low speeds, smooth stepless acceleration and deceleration, and dynamic braking. At present, a standard drive is available for ratings up to 1 hp. for single-phase operation on 110- or 220-volt, 60-cycle systems. Special drives of larger horsepower rating can be designed to suit particular requirements.

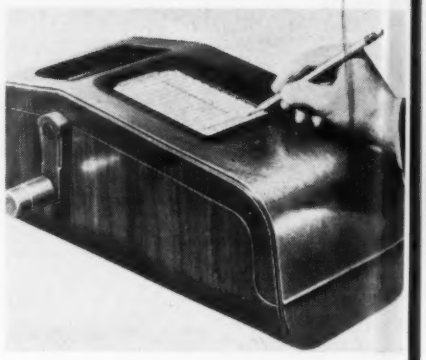
The new drive has four parts. These are: (1) power transformer for separate mounting, (2) Mot-O-Trol cabinet with thyratron-tubes and current-limiting and speed-regulating control, (3) control station with potentiometer to vary the voltage supplied to the armature and field circuits and with start and stop push buttons, and (4) shunt-wound, d-c motor.

The standard Mot-O-Trol is designed automatically to regulate a preset motor speed so as to maintain essentially constant speed regardless of load. The Mot-O-Trol converts alternating current from the power line into the required direct current by means of two electronic tubes, called thyratrons, which allow current to pass in one direction only. A grid inside these tubes is connected to a speed-control dial in front of the operator. Turning this dial varies the voltage on the grid so that it lets more or less power pass through the tube to the motor. The speed-control dial moves a metal button that rides on a semi-circle of smooth carbon. It can be turned to any desired point, giving an infinite number of speed variations over the complete range. On the Mot-O-Trol control board there are two of these dials, one for forward and one for reverse speeds. Power coming through the two main tubes is fed into the revolving part of the motor. When the speed range of these tubes is exhausted, the control dial acts upon a second pair of thyratron tubes, smaller in size, that widen the speed range still more by increasing or reducing the amount of power going into the field coils.

Electronic control cabinet, pushbutton control station, and d-c. motor for Mot-O-Trol (Westinghouse)

Autographic Register of Non-strategic Materials

A cabinet register constructed of laminated plywood and hard wood working parts, has been developed by Standard Register Co., Dayton, Ohio. Shaped and molded under pressure and heat, this register weighs 8 lb. as compared with 15 lb. for the steel model. Binding material and finish are moistureproof; working parts do not build up static electricity, nor does the cabinet spark if struck.



Business register made of wood (Standard Register)

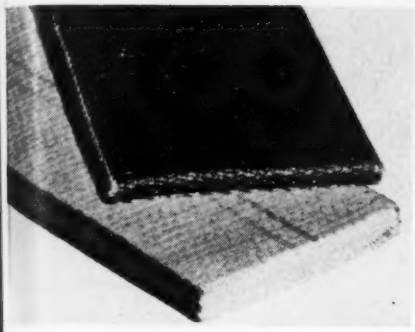
A current use of the autographic register is in connection with the visitor control systems at plants working on war contracts. The writing of sets of forms provides a pass and an exact, permanent record of visitors at reception desks, gates and at entrances to restricted areas about textile mills. The register may also be used for the recording of employee absences, for record control systems of requisitions, receiving reports, stock room withdrawals, etc.

Corkboard for Textile-Mill Roof Insulation

WPB Order No. M-8A, of the War Production Board, as amended February 20, will permit corkboard to be used, without priority, for textile mill roof insulation, for the insulation of air-conditioning equipment, and all other non-war purposes previously banned under the mandatory priority control system. This development indicates that the danger of a cork shortage is past and that there is an ample supply of cork available for the manufacture of cork cots and all other cork products needed by the textile industry.

Leather Substitute

Cottonleather, a new product developed by Southern Friction Materials Co., Charlotte, N. C., is being employed as a substitute for leather for certain purposes. The product consists of a cotton fabric of two to six plies in thickness which has been impregnated with a thermosetting binder, cured, calen-



Cottonleather (Southern Friction Materials)

dered, and surface-ground to resemble leather in color. It is semi-flexible, water-repellent, and resists oil and heat. An outstanding characteristic is its good-resistance to abrasion, which has made it suitable as a substitute for shoe-sole leather. Among industrial applications suggested are for pickers, motor-support pads, shock-absorbing pads, bearing mounts, draw-bar spacers, and anti-rattlers. It is not recommended as a belting material. Cottonleather is available in widths up to 6 in. and thicknesses up to $\frac{1}{8}$ in.

Electric Tachometer

An electric tachometer suitable for use in textile mills, has been introduced by Stewart-Warner Corp., 1826 Diversey Parkway, Chicago. This type of tachometer may be used on slashers, beamers, and other types of high-speed textile equipment to provide remote production control readings at distances up to 100 ft. from the machine. No battery or other current is required and flexible tubing is eliminated. Connection between sending unit and the indicating head is made by a wire and loom assembly.

Glass Tanks

Glass tanks that may be used in dyehouses and that are non-corrosive and shock-resisting, have been announced by Pittsburgh Plate Glass Co., Pittsburgh, Pa. These tanks use a minimum of critical material and are actually made of glass by building up the required shape and size of heavy tempered glass plates. The result is a rigid, permanent, sturdy tank, free from maintenance or wear. A new method of heat treating gives to the tank material a physical strength four to five times greater than ordinary glass. Furthermore, the glass has a high resistance to thermal shock. It will withstand continuous operating temperatures of 650°F. and an instantaneous thermal shock of 400° to 500°.

All joints are accurately ground. In addition, use is made of a joining material developed especially for this purpose. The entire tank is usually surrounded by a wooden frame work filled with a compound to support the glass. This frame serves both as insurance against leaks and as protection against severe physical blows.

Useful Accessories for Textile Mills

Fluorescent lighting units made almost entirely of non-priority materials are offered by Wakefield Brass Co., Vermilion, Ohio. The reflector is formed of a Masonite board that has a baked enamel surface. Bass-wood louvers provides adequate shielding of the lamp. The side frame and exposed end frame are of birch. All wooden pieces are anchored with metal pins at the corners and cemented with glue that will withstand changes in humidity.

Inter-office two-way communication between five stations is possible over a Talk-A-Phone, developed by Talk-A-Phone Mfg. Co., 1219 W. Van Buren St., Chicago. This method of communication eliminates use of a switchboard and will permit conversation between stations at a distance up to 2,000 ft. This system operates on 110 volts, a.c. or d.c. Other systems are available using 10, 20, 30, 40 and 50 stations.

A new circuit for fluorescent lighting fixtures and a specially designed ballast control unit have been developed by General Electric Co., Nela Park, Cleveland, Ohio. This system makes possible a saving in critical metals and improves lighting efficiency by permitting the use of only one ballast or control unit with four 100-watt fluorescent lamps.

Emergency lighting unit for wartime service which requires no fixtures or wiring other than plug-in connections to the a-c supply, is announced by Electric Storage Battery Co., Philadelphia. The lighting unit can be used as a source of emergency lighting in plants working on contracts for the Army and Navy. As the unit obtains its power from a source of supply outside the plant, it is not dependent upon the plant feeders and may be used in an emergency for lighting the plant when there is lighting failure, thus preventing accidents.

AIR-CONDITIONED LABORATORY OF INTERNATIONAL BRAID

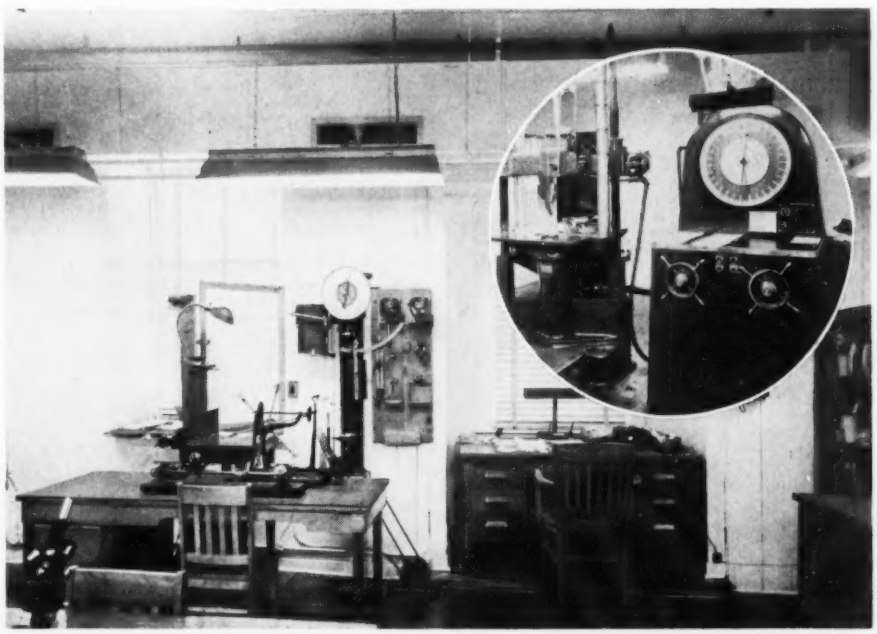


Photo courtesy of Carrier Corp.

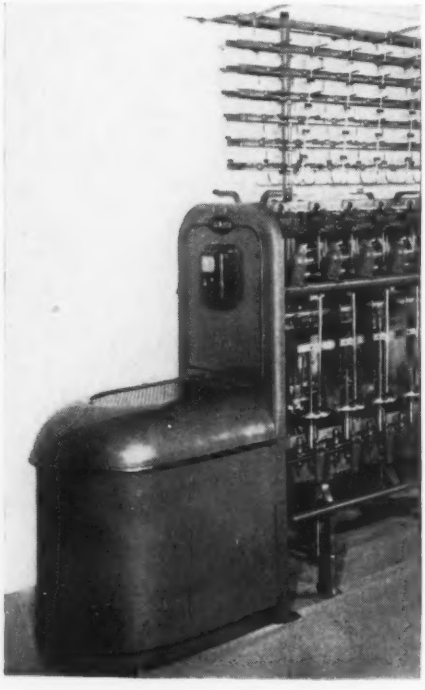
INSTALLATION of Carrier Corp. air conditioning equipment in laboratory of International Braid Corp., Providence, R. I., permits all tests to be carried out under standard conditions of 70° F. and 65% r.h. Insert shows some of machines employed for testing parachute harness, bomb slings, machine-gun webbing, and other products which International is making for military use. The laboratory is considered to be one of the best equipped in the Providence area, and the company is making its facilities available to other concerns engaged in production of vital war materials.

Mill Maintenance Section

Maintenance of 5B Twisters

Best possible service from every twister should be foremost in the mind of the throwster. A few simple things need watching, as pointed out in an article, appearing in the February issue of *Atwood Twists*, published by Atwood Machine Co., if this goal is to be reached.

The motors on your Atwood uptwisters and "5B" ring twisters operate at fairly low temperatures and as overheating is the surest and commonest sign of trouble, it pays to take their temperatures at regular and frequent intervals. You wouldn't want a doctor to estimate your temperature by hand. You'd want him to use a thermometer. The same goes for your motors. Use a regular Centigrade thermometer and figure that about 30° C. above room temperature is "normal." The motors are guaranteed to operate satisfactorily at temperatures up to 40° C. above room temperature, but above that it is better to look for and remove the cause.



The motor drive of the 5B twister is well protected from dust and dirt, but readily accessible for inspection, cleaning and lubrication.

Overheating is generally caused by an overload on the motor and this in turn may be traced to:

1. Low voltage—which should be considered in connection with the source of electric power.

2. Excessive belt tension—subject to ready adjustment.

3. Improper spindle oil — judging from experience this is a more common cause of excessive power consumption than one might think. A 100-110 viscosity oil at 100° F. Saybolt is recommended for new spindles—a heavier oil may be required as the upper bearing wears.

If it is found that the wrong oil is used, the steps taken require washing out with kerosene before refilling with the correct oil.

4. Unbalanced packages—it is decidedly poor economy to use poorly constructed, unbalanced bobbins or delivery packages. The excess power required may run as high as 40%.

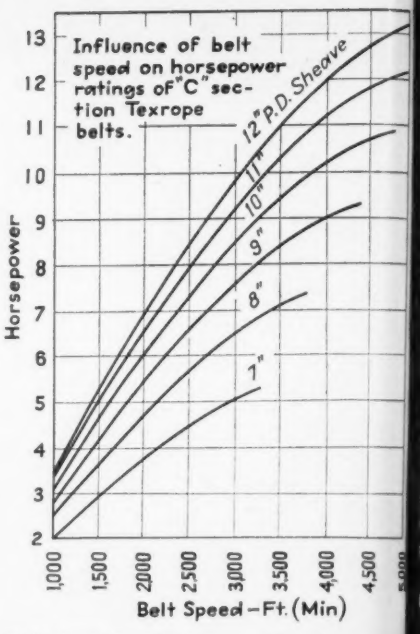
5. Excessive spindle speed—operating spindles at higher than recommended speeds increases power input very rapidly. A 10% speed increase will take as much as 30% more power.

Larger Sheaves Permit Higher Speed

Would you like to save $35 out of every $100 spent for replacement of V-belt drives and $15 out of every $100 spent on new drives? Well, here's how —according to Walter Geist, president of Allis-Chalmers. And, at the same time you will help industry to save 250,000 lb. of crude rubber this year.

The plan which appeared in *Texrope Topics*, published by this company, is geared to present design limitations and only slight changes in dimensions of sheaves are necessary. Also, it should not be regarded as a temporary, wartime expedient, for the increases in sheave diameters are sound and practical—in line with a long-range trend to larger diameters.

V-belts may be operated at speeds up to 5,000 ft. per min. efficiently. Above this speed slippage is threatened by centrifugal force which tends to cause belts to fly outward. If belt speed is increased to approximately this figure



Relationship between V-belt speed and horsepower.

using a larger sheave and the same speed of the machine being driven is maintained, increased horsepower may be transmitted, as shown in the accompanying chart. Use of larger sheaves will reduce belt failure because bending of a V-belt about too small a sheave contributes to belt wear and failure. Higher belt speeds will multiply horsepower ratings of belts two and three times.

An example illustrates these principles. Using 12 in. and 3 in. sheaves for a 2 hp. motor with a full-load speed of 1740 r.p.m., a belt speed of 1360 ft. per min. is obtained with a driving capacity of 2.7 hp. Because the sheave diameters are relatively small, the belt speed is low to prevent rapid wear. This drive requires three belts.

If the sheaves are increased to 15 in. and 3.8 in., respectively, the belt speed will be increased to 1670 ft. per min. and the driving capacity to 2.8 hp. Because larger diameter sheaves are used the belts travel through a greater distance to do their work and only two belts are needed.

Motors for the Job

Savings in critical materials, such as copper, steel, and aluminum are possible, according to A. C. Streamer, vice-president, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., if six recommendations are followed by mills.

To make full use of all motor horsepower:

1. Motors open to the air should be overloaded 25% above their name plate

QUALITY IS AS IMPORTANT AS QUANTITY

With popular emphasis on increasing *production* for war, SONOCO could take the easy way—cut a few corners on quality, shorten the time needed for some operations, and produce more.

But a large number of SONOCO customers are manufacturing war materials. They must not only get "enough, and on time," but with their operations geared to and depending on SONOCO standards of quality, they must get *that* too.

The only corners we have cut have been to streamline our production lines. We have increased our working time, but we have not shortened a single vital operation.

SONOCO will continue a dependable source of supply on Textile Paper Carriers.

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rating unless the surrounding temperature is exceptionally high. Enclosed motors can be overloaded 10% and d.c. open motors 15% under the same conditions.

2. Most mills using small motors have 220 or 440-volt power supplies. WPB has asked that 440 volts be used, because this reduces the amount of copper required in leads and control apparatus.

3. Use standard sealed sleeve bearing motors unless ball bearing motors are absolutely essential. Ball bearings are urgently needed in other war machinery.

4. Use motors of highest practical standard speed and avoid the use of multispeed motors. Faster motors are smaller and require less critical materials to build.

5. Use a.c. motors in preference to d.c. types wherever possible. This saves substantial amounts of copper and helps alleviate a shortage of d.c. motor manufacturing capacity.

6. Match control and circuit protective equipment to the motor on the basis of name plate horsepower rating, thus getting the maximum use from control equipment.

An example of savings possible, following the recommendations outlined, amounted to saving 36 lb. of vital materials by using a motor rated at 1 hp., instead of a 1½ hp., to operate a machine designed for a 1¼ hp. load.

Tension Regulation Increases Life of Belts

Rubber, in any form, is difficult to replace. Consequently, rubber belts used in driving textile machinery must be given care to prolong their useful life.

Conclusive evidence that the life of transmission belting is greatly influenced by the tension factor is offered in tests conducted by George H. Stewart, belting engineer of B. F. Goodrich Co. Results of the tests are released by the company as another contribution to the country's rubber conservation program.

Three grades of the present wartime construction of transmission belting were used in this series of tests, which were run at 15 lb. per in. per ply, a 720 lb. total for the tension, the recommended figure, and a 18 lb. per in. per ply, a total of 864 lb. tension, on 4 in. pulleys. Belts were all 6 in. wide, 30 ft. in length, spliced in 10 ft. endless lengths. Tests were all highly accelerated.

Belt No. 1 ran for 95 hr. before breakdown while under the 18 lb. tension, and increased its life to 230 hr. before failure when the 15 lb. tension was used.

Belt No. 2 ran for 88 hr. at the 18 lb. tension, and for 263 hr. before failure at 15 lb.

Belt No. 3 ran for 15 hr. under 1 lb. tension, and the service life befor failure jumped to 48 hr. under the 1 lb. tension, greater belt life being ob tained at recommended tensions.

New Dyes and Chemicals

Flameproof Camouflage Colors

Special flameproof colors which are said to meet all requirements of the Engineer Corps for flameproofed camouflage shrimp netting have been announced by Aridye Corp., Fair Lawn, N. J. These colors are available in two shades, CFP Sand #3 and CFP O. D. 9.

Aridye CFP colors may be applied in a variety of ways, depending on the equipment available. In general, what is desired is a means of impregnating the fabric and removing the excess liquor, followed by a drying operation. Best results are obtained when the colors are applied in a solvent solution. However, successful results can be obtained with a water-in-oil emulsion if the available drying equipment provides some means of compensating for shrinkage of the fabric. Removal of solvent vapors is necessary with any mixture containing solvent.

These CFP colors are concentrates containing the proper blend of pigments, binders, and flameproofing materials. To prepare a mix, it is necessary merely to dilute with solvent and add a mildew-proofing agent.

Finish for Camouflage Nets

A new fire-, water-, and weather-resistant finish for cotton camouflage nets used in all climates has been announced by the Fine Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. The new finish is flexible in sub-zero weather and will not become sticky or support combustion at high temperatures. It is made in sand and olive-drab shades, which are very fast to light and exposure. This finish is supplied as an aqueous emulsion, which can be applied by padding and drying with moderate heat treatment. Although developed especially for the Army, such peacetime applications as the treatment of tobacco cloth are indicated when the material is available for civilian uses. It is called Camouflage Sand No. 3 Finish and Camouflage Olive No. 9 Finish.

Permanent Cellulose Finish

Development of a new permanent cellulose finish, known as Kopan, is announced by Hart Products Corp., 1440 Broadway, New York. Kopan is recommended for finishing sheets, damasks, shirtings, and other woven fabrics, as well as a variety of knitted materials. The new finish is an outgrowth of the company's product Permalon, which is being employed in finishing mosquito nettings and other military fabrics. Kopan, however, is available in several viscosities to provide a variety of finishes. Among the advantages cited for the new product are that it minimizes shrinking or stretching of fabrics during laundering or drycleaning, increases tensile strength and resistance to abrasion, and prevents slippage of yarns. It can be applied without use of special equipment before the boil-off, during mercerization, or after bleaching or dyeing. It is compatible with fillers, pigments, and weighting agents.

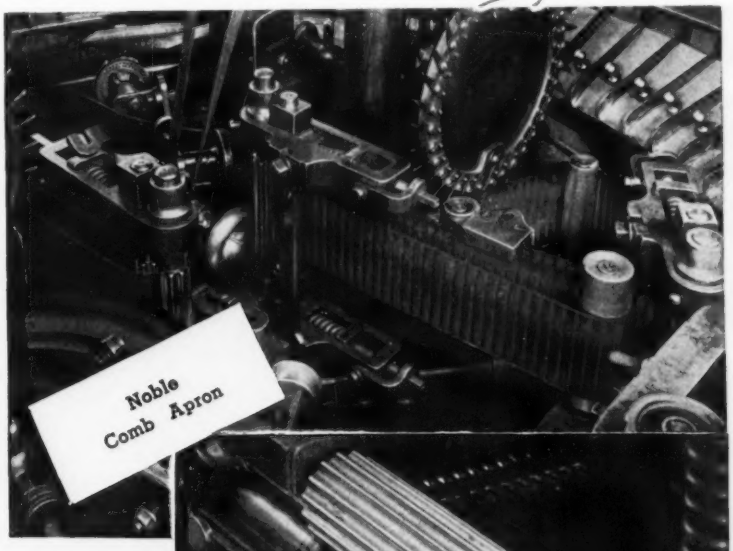
Return Empty Cylinders

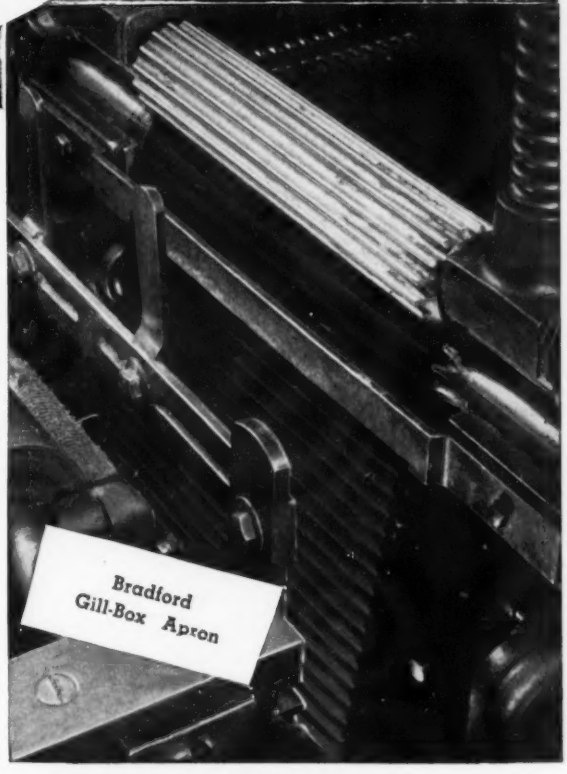
Shortage of cylinders for chlorine, ammonia, carbon dioxide, and other compressed gases needed by many essential industries is becoming more and more acute, and, to prevent drastic restrictions in the distribution of these chemicals, all users and transportation companies are urged to cooperate in returning the containers to the producers. R. J. Quinn, of Mathieson Alkali Works, Inc., states: "Most users of compressed gases are probably trying to return their cylinders promptly, but many find that the railroads and the trucking companies are becoming increasingly unwilling to handle small shipments. This situation can be remedied, however, if transportation managers fully understand the importance of getting cylinders back for refilling as quickly as possible, and if shippers of cylinders will cooperate with the transport companies in arranging shipments that can be handled economically."

WORSTED APRONS

FOR BRADFORD COMB AND GILL BOXES

are Fussy Things





Not only must they be of even thickness throughout, ave minimum stretch, run straight, nd have waterproof laps which are rong, flexible, and of even thickess overall—as in all Barnes aprons they must provide a certain fussy elation between their surfaces and he wool fibers which they grip. The prons must grip the wool gently but rmly and carry it forward in just the anner which assures a properly ade yarn.

oes it strike you as strange that so many atempts to produce satisfactory aprons from subitutes and even from the best leathers by nexperienced hands have failed? It shouldn't, ecause the fussy relationship of which we peak can be attained only through long reearch and many years of experience in orsted problems.

arnes buys the right leather and gives it the ight processing. Our apron leather is tanned rom finest Foreign and Premium Domestic teer Hides in our own tannery, and only the nost selective hide area is used, clear of all ide imperfections.

arnes' aprons are hand processed throughout nd are thoroughly seasoned before shipping.

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Post-War Obstacles and Opportunities for Business

MARKETS AFTER THE WAR, by S. Morris Livingston; Department of Commerce, Washington, D. C.

This booklet represents the result of the combined efforts of the entire National Economics Unit of the Department of Commerce, and was made possible by the basic research elsewhere in the Department, according to the introduction by O. P. Hopkins, acting director of the Bureau of Foreign and Domestic Commerce. It is designed to assist marketing analysts in setting their sights on a common goal of post-war opportunity for American business.

Starting with the now widely-accepted proposition that a high level of highly productive employment must be maintained after the war, it seeks to answer three questions:

1. What would total business volume be if most of the people who will want to work after the war do have productive jobs?

2. How does the war affect the possibility of reaching that goal? What will be the magnitude of the accumulated demand for goods? How big a backlog of purchasing power in the form of extra savings? What obstacles must be overcome?

3. What opportunities would such a national market offer your business? Starting with an assumed total volume of business which may be far above the best prewar year, how can you determine the market potential for your products?

In connection with the third question, the booklet includes a hypothetical breakdown of total output by commodity groups for a post-war year, 1946. For instance, this projection indicates in 1946 a 72% increase over 1940 in clothing and accessories, and a 78% increase in dry goods and notions, as compared with an average increase of 70% for the total gross national product. However it is emphasized that this is not a forecast. It points out that factors for which no allowance has been made could create wide distortion in some instances.

It is, however, an excellent starting point for further study and refinement. It is worth the careful attention of all men planning now for post-war markets.

To Stimulate Helpful Suggestions

HOW TO "THINK UP", by Alex Osborn; McGraw-Hill Book Co., New York.

How to draw out constructive ideas from members of an organization is briefly outlined in this little 40-page manual. The author wrote it originally to stimulate the creativeness of each and every one in his own company (Batten, Barton, Durstine & Osborn, Inc., New York), of which he is executive vice-president. Bruce Barton, of the same firm, persuaded Mr. Osborn to offer the manuscript for general publication, in the hope that its circulation would aid in the endeavor to think up more ideas for the war effort.

Textile mills which may have wrestled successfully or unsuccessfully with the question-box idea, may find the suggestions in this book useful for guidance.

An Import-Export Guide

CUSTOM HOUSE GUIDE, 1942 Edition; Custom House Guide, 10 Bridge St., New York; 1500 pages; price, $15.00

The "Custom House Guide," in its 80th year, is now being distributed. Revisions have been unusually heavy; Argentine and Cuban Trade Agreements have changed many rates of duty in the alphabetical index of 30,000 commodities; Customs, Shipping and Commerce Regulations, as well as the Internal Revenue Code have likewise been considerably altered due to war legislation and regulations.

Other Publications of Interest to Textile Men

MOTION STUDY, by Herbert C. Sampter; Pitman Publishing Corp., 2 W. 45th St., New York. Principles of motion study are set forth in this book in an elementary manner, making it suitable as a text for industrial-group study. Flow process charts, group charts, and rearrangement of machinery for motion economy are a few of the subjects covered.

EVALUATING STARCHES FOR TEXTILE PURPOSES, by W. T. Schreiber and William L. Stafford; Engineering Experiment Station, Alabama Polytechnic Institute, Auburn, Ala. Textile mill men will be interested in this bulletin, as technical test methods are presented to measure certain properties imparted to fabrics by the starching operations and the properties of starch mixtures. Such tests as measuring the stickiness of starched fabrics during drying, penetration of starch mixtures, transparency of starch films, effect of crushing starched fabrics, and the stiffness and smoothness of fabrics are outlined.

MAINTENANCE HINTS—Vols. 1 and 2; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. $1. Textile mill maintenance men will be interested in these two volumes containing a total of 220 pages of information about the care of electrical apparatus. Volume 1 deals with the cleaning, inspection and maintenance of motors. Volume 2 covers maintenance of contactors, transformers, and power transmission.

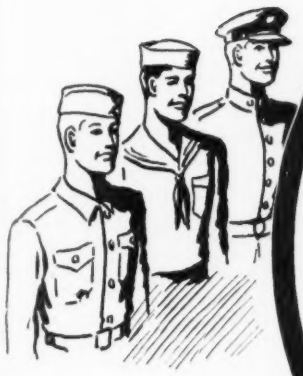
PLASTICS, by J. H. Du Bois; American Technical Society, 850 E. 58th St., Chicago; $3. Written by a sales engineer, this book provides a detailed summary of the various types of plastics available and methods of manufacture and fabrication such as would be of value to anyone that is a constant user of plastics.

PREVENT OFF-THE JOB ACCIDENTS AND STAY ON THE JOB; Association of Casualty and Surety Executives, 60 John St., New York; $2.50 per hundred. This small pamphlet is intended for distribution among employees as an appeal for them to avoid accidents during the war crisis. Traffic accidents and safety in the home are covered in their various phases.

SIMPLE BLUE PRINT READING WITH SPECIAL REFERENCE TO WELDING. 2nd Edition; Lincoln Electric Co., Cleveland, O. 50c. Contains 146 pages, 96 drawings, covering blue print reading as required by welders so they may understand the symbols used in drawing various types of welded joints.

HANDBOOK OF SLEEVE BEARINGS: A. B. Willi; Federal-Mogul Corp., Detroit, Mich. Discusses the effect of design, alloys, and manufacturing methods on sleeve-bearing efficiency. Also defines the field application for each basic type of sleeve bearing. As a reference guide, bearing and bushing sizes and types are listed.

TRAINING OXY-ACETYLENE WELDING AND CUTTING OPERATORS—INSTRUCTORS' OUTLINES: International Acetylene Association, 30 E. 42nd St., New York. 25c. Contains 88 pages, divided into 3 chapters of essential information for the training of welding operators and welding inspectors.



OF DIXIE'S PAYROLL

10%

IS INVESTED

IN WAR BONDS

DIXIE EMPLOYEES BUY WAR BONDS

The World's Safest and Best Investment!

Chattanooga, Tenn., May, 1943. — The larger part of DIXIE DURENE production is "enlisted" with our Army and Navy—helping supply the many clothing and equipment needs of our Armed Forces.

In addition to their part in manufacturing vitally needed yarn, men and women at Dixie regularly invest over 10% of Dixie's payroll in WAR BONDS. They are grateful for the opportunity to serve.

Dixie MERCERIZING COMPANY

CHATTANOOGA TENNESSEE

AMERICAN COTTON MADE IN U.S.A.

News of Suppliers

Steel Heddle Mfg. Co.'s employees at the general office in Philadelphia, Pa., and the plants at various locations, have established a fund, raised by voluntary contributions, which is divided up every three months into equal parts and sent to each ex-employee service man with a real "letter from home," filled with news and things of interest to them. The money is handled by a committee consisting of veterans of the previous war.

Armstrong Cork Co., Lancaster, Pa., has elected Keith Powlison as vice-president and controller. Succeeding him as treasurer is M. J. Warnock, formerly director of advertising and promotion; while succeeding Mr. Warnock in the last maned office is Cameron Hawley, with the company since 1927 and lately assistant director of advertising and promotion.

Rohm & Haas Co., New York, has started production at its new war plastics plant in Knoxville, Tenn. Maximum production will be reached gradually as some machinery was still being installed last month.

Barber-Colman Co., Rockford, Ill., has issued a handsomely bound and illustrated memorial booklet devoted to the life and achievements of Howard D. Colman, founder of the company, who died last year. On his numerous patents, the major devices made by the company are based. Mr. Colman has been succeeded as president of Barber-Colman Co. by Harry A. Severson, formerly vice-president and treasurer. He retains his office as treasurer. Earl D. Parker, formerly vice-president and works manager, is now vice-president and general manager. John G. Jones continues as secretary.

G. H. Waterman Co., Providence, R. I., has established southern headquarters in the Johnston Bldg., Charlotte, N. C. E. H. Fritzenger will be in charge.

Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J., has appointed Ralph M. Fischer and R. C. Morrison to head up the activities of the division of the application and technical aspects of synthetic resin textile finishes.

Stein, Hall & Co., New York, has appointed W. M. ("Bill") Kline, Jr., assistant manager of the southern branch at Charlotte, N. C. He has been associated with Stein-Hall for 14 years, since his graduation from Clemsen College.

Interchemical Corp., New York, has acquired substantially all of the stock of Cotan Corp. The former personnel is being retained, with C. T. Melvin as president and R. F. Lewis as vice-president. Cotan makes coated fabrics such as those used for upholstery, raincoats, handbags, theatre seats, automotive upholstery and similar uses. W. F. Cornell, of the parent company, will devote most of his time in the immediate future to the study of markets for Cotan products for war application as well as for post-war sales.

Glyco Products Co., Brooklyn, N. Y., has moved its administrative offices to larger quarters at 26 Court street, Brooklyn.

General Electric Co., Schenectady, N. Y., has appointed R. B. Horning as manager of the Charlotte, N. C., office, succeeding E. B. Coles, who after more than 47 years of service retired under the G. E. pension plan April 1.

Aqua-Sec Corp., New York, has appointed John C. (Jack) Robertson as southern sales manager. He will make his headquarters at Atlanta, Ga. For the last several years he has represented Beach Soap Co., Lawrence, Mass. Thomas Baravalle has rejoined the technical staff of Aqua-Sec, after a year with Procter & Gamble Co., and will make his headquarters in New York.

DR. WALTER SAVAGE LANDIS, vice-president of American Cyanamid Co., who has been awarded the gold medal of the American Institute of Chemists. The medal, which is awarded annually for outstanding services to the science of chemistry, is being presented to Dr. Landis not only for his contributions to chemical engineering and development in the field of nitrogen derivatives, but also for his services to the professional side of chemistry.

ROBERT H. MORSE, JR., who has been appointed general sales manager of Fairbanks, Morse & Co. He has been with the company since 1916.

General Printing Ink Corp., New York, has recently established a new branch, the General Industrial Finishes Division, the purpose of which is to study and solve wartime problems in textile finishing. The new division does not intend to produce products to compete with established lines of finishes, but to take on new or unsolved problems, such as those relating to proofing textiles against fire, weather, mildew, and other destructive agencies.

George Gerry & Son, manufacturers of pickers, lumpers and dusters, are now located in a new plant at Athol, Mass.

International Nickel Co., New York, has started a series of advertisements in consumer media stressing the spirit of cooperation necessary between nations, groups, and businesses after victory has been won to maintain a stable peace.

National Starch Products, Inc., New York, has entered into a program for planting, growing, and harvesting of "waxy maize," a new type of starch-bearing plant, the kernels of which have a wax-like appearance, although they actually contain no wax. It is a domestic-grown replacement for tapioca.

Sylvania Electric Products, Inc., has elected Walter E. Poor, previously executive vice-president, to be president, succeeding B. G. Erskine, now chairman of the board. Noel E. Keeler, controller and assistant treasurer, has been made treasurer, and Philip P. Borden has been named assistant

"Cotton Fights on Every Front"

COTTON has gone to war. Used for purposes unheard of up to a year ago these war-born products will exert profound changes in the use of cotton in both apparel and home furnishings. The Cotton-Textile Institute says: "While many of the new finishes and products designed for war are not available to consumers as yet, they will be with the cessation of hostilities."

Coincident with the development of many of these new finishes and new products, Kaumagraph has been privileged to work out and put into practical use methods for their identification.

In the time of peace to come, identification for the new textiles to be offered in free competition will be increasingly important. Attractive marking, attractive labeling and packaging will be essential for protection, vital in obtaining distribution, acceptance and preference for the new merchandise.

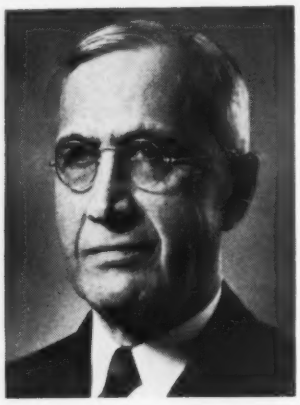
It is none too early to anticipate the identification you will give your postwar products. Whether cotton or wool, rayon or other synthetics, felt or leather — any texture, any surface, Kaumagraph can provide the safe, certain, attractive, economical means of adequate identification. Why not send for a Kaumagraph Identification Man today?

Identification Headquarters since 1902

KAUMAGRAPH
Wilmington, Delaware

Dry Transfers
Prestomarks
Embossed Seals
Lithographed packaging

New York Office, 16-22 E. 34th St. . . Representatives in Principal Textile Centers of the World



JOHN P. WHITE, for 30 years southern manager of Corn Products Refining Co's. Textile and Paper Division, who has recently retired.

treasurer. Mr. Poor has been a director of the company since its incorporation under the Hygrade name in 1917, concerning himself largely with engineering and research.

Torrington Co., manufacturer of precision products, announces that its subsidiary, Bantam Bearings Corp., South Bend, Ind., will operate in future as the Torrington Co., Bantam Bearings Division. Headquarters will remain at South Bend.

Owens-Corning Fiberglas Corp. has leased a factory in Pennsylvania purchased by the Defense Plant Corp. at a cost of approximately $1,600,000, to produce the glass fiber textiles needed in construction of planes, tanks and ships.

Monsanto Chemical Co., St. Louis, Mo., has elected as president Charles Belknap, who lately has been chairman of the executive committee and executive vice-president. Edgar Monsanto Queeny, for the last 15 years president, was elected chairman of the board, a position vacant since the death in 1933 of his father, John Francis Queeny, founder and first president of the company.

Devoe & Raynolds Co., New York, has appointed Kenneth H. Wood as executive manager of the company's Painter and Maintenance Division and its newly created National Accounts Division. He will be responsible for policies and sales activities and will have his offices at the New York headquarters of the firm. Milton Lightcap, who has been serving as sales manager of the department, will continue in the same capacity. Until recently Mr. Wood was director of sales and distribution of the Sherwin Williams Co., Cleveland, Ohio.

General Electric Co., Schenectady, N. Y., has appointed 18 electronic specialists to help industry with electronic application problems. Their names and locations follow: I. C. Diefenderfer and D. C. Hierath, New York; J. F. Getz, Philadelphia; A. J. Moore, Boston; W. B. Frackelton, Chicago; L. E. Donahue, Los Angeles; J. A. Setter, Denver; I. F. Conrad, St. Louis; A. D. Boardman, San Francisco; L. B. Parsell, Detroit; L. R. Elder, Portland, Ore.; Frank C. Neal, Jr., Dallas; R. H. Jackson, Atlanta; K. H. Keller, Cleveland; R. C. Norris, Cincinnati; A. M. Dawson, Pittsburgh; B. Cogswell, Buffalo; L. F. Stone, Newark. General Electric Co. reports that orders received during the first quarter of 1943 amounted to $422,047,000 compared with $299,120,000 for the corresponding period of 1942, an increase of 41 per cent.

Pittsburgh Plate Glass Co., Columbia Chemical Division, Pittsburgh, Pa., has prepared a series of nine advertisements paying tribute to the war production of eight different industries after a general tribute introducing the series. Recently published was the advertisement covering textiles under the line "Spinning a web for victory!"

Westinghouse Electric & Mfg. Co. has appointed Thomas C. Finnell as manager of the Industrial Department in the Eastern District. He succeeds C. W. Miller, who was named manager of the Application Department of the Radio Division at Baltimore.

Link-Belt Co., Chicago, has elected Frank S. O'Neil, general manager of the company's Indianapolis operations, to vice-president of the company, succeeding James S. Watson, who has just rounded out 50 years of service and plans to retire at the end of this year. Mr. O'Neil's headquarters will continue at Indianapolis.

SKF Industries, Inc., Philadelphia, have elected Thomas W. Dinlocker as vice-president and treasurer; Richard H. DeMott as vice-president in charge of sales; and C. P. Collins, as secretary.

Power Specialty Co., Houston, Tex., has admitted R. H. Knipping to the firm. He will shortly take over the San Antonio, Austin, and Corpus Christi territory which he covered some years ago.

Wheelco Instruments Co., Chicago, has named Hugh Acock, formerly in the Tulsa territory, to be Texas district manager with headquarters in Houston; C. H. Garrison has been named Kansas City representative; Russell George has been added to the sales and service department of the Combustion Safeguard Division, with headquarters in Chicago.

American Crayon Co., Sandusky, Ohio, has elected Earl L. Curtis as president. He joined the company as office boy in 1906.

Roller-Smith Co., Bethlehem, Pa., has appointed Roy M. Smith who joined the company last year as assistant chief engineer, to be chief engineer, succeeding J. D. Wood, resigned.

Greene, Tweed & Co., New York manufacturers of Palmetto and other mechanical packings, Basa soft-face hammers and Favorite reversible ratchet wrenches, have appointed J. J. McIntosh as southeastern sales representative and B. F. Coombs as Texas sales representative. Mr. McIntosh will have headquarters at 1106 McLynn Ave., Atlanta, Ga., and Mr. Coombs at Route 12, Box 495, Houston, Tex.

Chain Belt Co., Milwaukee, Wis., has appointed William W. Klemme as distrist manager of industrial sales in Dallas, Texas. Mr. Klemme, previously district manager at Buffalo, N. Y., has been with the company since 1935.

Formica Insulation Co., Cincinnati, Ohio has elected five new vice-presidents as follows: W. J. Gebhart, vice-president in charge of finances and accounting; J. Roger White, vice-president in charge of sales and advertising; George H. Clark, vice-president in charge of engineering; R. W. Lytle, vice-president in charge of special engineering; Ellsworth G. Williams, vice-president in charge of manufacturing.

WPB RESTRICTS DOGWOOD TO TEXTILE USES

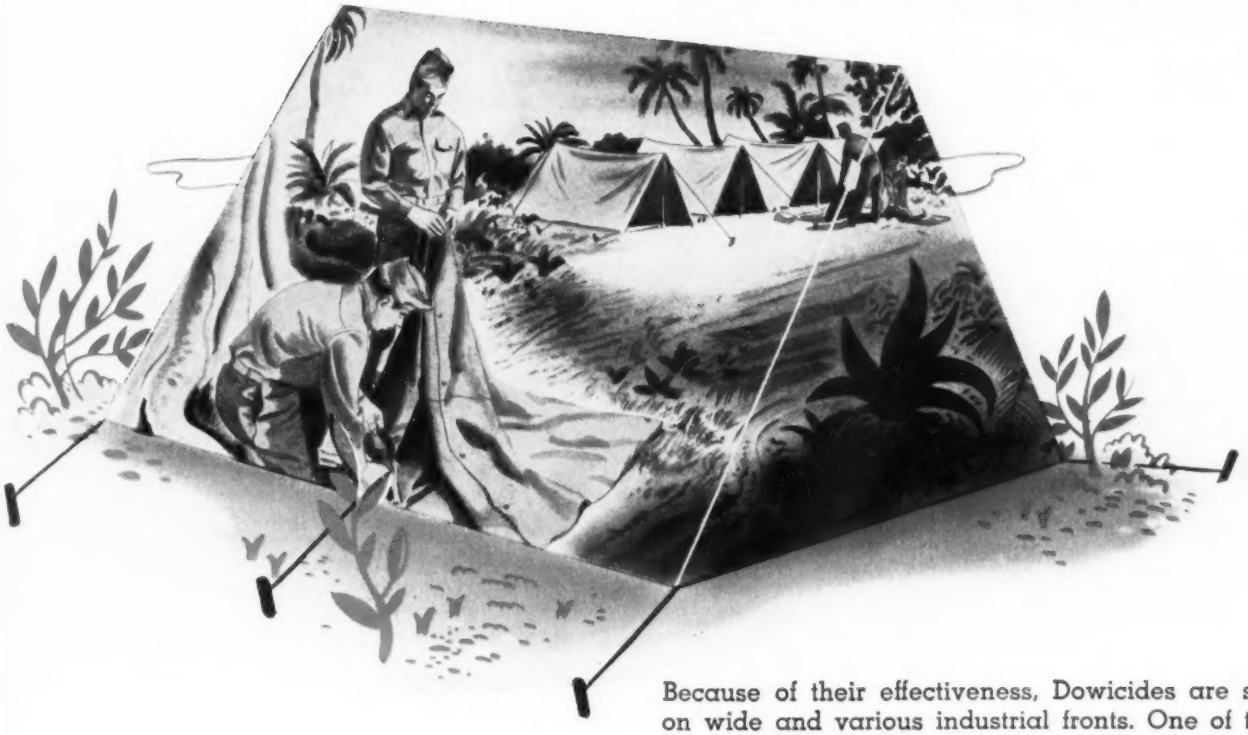
TO CHANNEL the entire production of dogwood into the manufacture of shuttles and other textile machinery parts, the War Production Board on Apr. 13 issued Limitation Order L-285, restricting use of this material to the textile industry and excluding other end uses where substitute species of wood would produce equally good results.

SETS CEILINGS ON HICKORY PICKER-STICK BLANKS

OPA has authorized manufacturers to charge the same price for mixed color and all-red picker sticks which they have been charging for all-white blanks. Maximum prices on direct mill shipments of blanks produced in South and North Carolina, f.o.b. mill are 10¢ for 1x2x36 in. dry size blank; 12½¢ for 1⅛x2⅛x40 in. dry size blank; $200 per 1000 board feet (on dry size basis) for all other sizes.

Life Expectancy Up—for Army Duck!

Protection for a wide variety of products against the destructive and disfiguring action of bacteria, molds and algae is being provided by Dowicides. These effective germicides and fungicides, of which there are 17, were developed by Dow as a result of exhaustive research in this field. They consist of a group of phenol derivatives which are produced with but one purpose in mind—to help in the control of microorganisms.



Because of their effectiveness, Dowicides are serving on wide and various industrial fronts. One of the important uses is in the preservation of army duck. Tents and other canvas products are made more serviceable and are given longer life through the application of Dowicides.

The usefulness of Dowicides is not limited to the textile fields . . . lumber, leather and paper products all benefit from Dowicide applications. They are applicable to almost every industrial need, providing maximum protection for numerous essential products.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • St. Louis • Chicago • Houston • San Francisco • Los Angeles • Seattle

PROTECTION FOR TEXTILES: Dowicides protect textiles against mildew and fungous growths. Incorporated in compositions for finishing, they provide an effective inhibiting action under widely varying atmospheric conditions—from arctic to tropical. This means longer life for all textiles. Write for full details.

DOWICIDE

GERMICIDES AND FUNGICIDES

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

FREE FOR THE ASKING

Readers interested in literature reviewed on this page may secure copies by writing to Textile World, 330 West 42nd St., New York, giving their company connection, title of item desired, and date of issue in which it was reviewed.

Dyeing of military fabrics is discussed in two bulletins issued by Calco Chemical Division, American Cyanamid Co. Bulletin 685 discusses package dyeing of mercerized yarn, O. D. No. 9, for knitted underwear. Data and formulas are given. Bulletin No. 688 contains formulas and technical information about dyeing of cotton fabrics O. D. No. 10 for raincoats, as covered in PQD 71-D and PQD 208-A. The first specification covers raincoats, synthetic resin coated, while the second specification covers raincoats, parka type, women's. Bulletin No. 681 contains formulas and technical information along with swatches dealing with the dyeing of fabric for work clothing with sulphur and vat dyes on materials such as twills, drills, jeans and gabardines.

Moisture in warp sizing, its control and advantages, are discussed in an article appearing in the April issue of *The Houghton Line,* published by E. F. Houghton & Co. Textile mill men will also be interested in another article contained in this issue which discusses castor oil and the difficulties textile mills are encountering in obtaining this product. Suggestions concerning substitutes for castor oil are contained.

Textile mill men should read the article dealing with a discussion of the effects of war on free enterprise, which appears in the April issue of *The Howard Way,* published by Howard Bros. Mfg. Co.

Controlled cyclonic cleaning in the spinning and twisting rooms is covered in the March issue of *The Swirling Column,* published by American MonoRail Co.

Every mill man will want to read the article entitled "Report from New Guinea," which appears in the March-April issue of *Clicks,* published by Durant Mfg. Co. This article specifically describes the atmospheric conditions existing in New Guinea and mentions the difficulties that our troops are having with clothing.

Correct lubrication of Roto-Coners and information concerning regular oiling schedules is given in No. 37 of the series *Getting the Most from Winding,* published by Universal Winding Co. Also of interest is an article dealing with the replacement of rocker shaft sleeves with traverse bar levers on the No. 90 winder. Winding room overseers will be interested in this issue as it contains a photograph showing the winding room of Tolar, Hart & Holt Mills, Fayetteville, N. C., which contains 480 spindles and over a period of years repair parts have cost less than 5 cents per spindle per year.

Strapping of military supplies by women is covered in a well-illustrated article appearing in issue No. 11 of *Process News,* published by Acme Steel Co. The part that women are playing in the shipping rooms of industrial plants throughout this country should prove to be interesting reading.

Air Express Wartime Wall Chart is being offered by Air Express Division of Railway Express Agency as a guide to those textile mills that frequently ship by air express. Items that can be shipped, priority information, special packaging, size of shipment and weight, and etc., are discussed. The chart also contains a map which illustrates graphically the time required for shipment by air express between shipping points in the U. S. Also contained is a list of districts and regional priority offices.

"Controlling Factory Production" is the title of a 34-page bulletin prepared by Policyholders Service Bureau, Group Division, Metropolitan Life Insurance Co., which deals with fuller use of machines and manpower. This report covers the responsibility for production control, scheduling, scheduling procedures, dispatching, progress control and duplicating processes. Mill men should find this report of value.

Double displacement proportioning equipment for acids, corrosive liquids and other clear solutions is discussed in Bulletin No. 4009 offered by Cochrane Corp.

A calendar illustrating various scenes in the Berkshire County region in Massachusetts and also showing up-to-date plant equipment in operation and wet finishing and drying equipment manufactured by James Hunter Machine Co., is offered by this company.

Drying equipment for the cotton, wool, silk and rayon, hosiery, carpet and related industries, is illustrated and described briefly in a catalog issued by Proctor & Schwartz, titled, "Proctor Drying Machinery for the Textile Industry."

Care of fire extinguishers of vaporizing liquid, soda acid, foam, anti-freeze and carbon-dioxide types, is discussed in an educational booklet titled, "Maintenance of First Aid Fire-Fighting Equipment," offered by American-LaFrance-Foamite Corp. Charts are contained in this booklet giving complete data in condensed form as to extinguisher and engine characteristics and the methods of operation, capacity, range of stream, etc.

Roll coverings is the subject of a 12-page booklet which has just been issued by Gill Leather Co. and which contains notes from the experiences of practical mill men throughout the country on the use of roller coverings from the rolls of spinning frames.

A link V-belt which may be taken apart at any point with an ordinary screw driver and then coupled together again without the use of any tool is discussed in a catalog and instruction manual offered by Manheim Mfg. & Belting Co. This belting may be secured in rolls and made up to fit the individual needs of the installation.

A textbook on contour saws has been issued by Doall Service Corp. This text contains pictures with charts and diagrams giving easy access to proper speeds and feeds in the shaping of all basic materials, including ferrous and non-ferrous metals and alloys, plastics, wood, fiber board, etc. Much information is also contained on machine tools and machine shop practice for the student or learner.

Hoists of the electric, spur geared and ratchet lever types are described in a folder issued by Coffing Hoist Co.

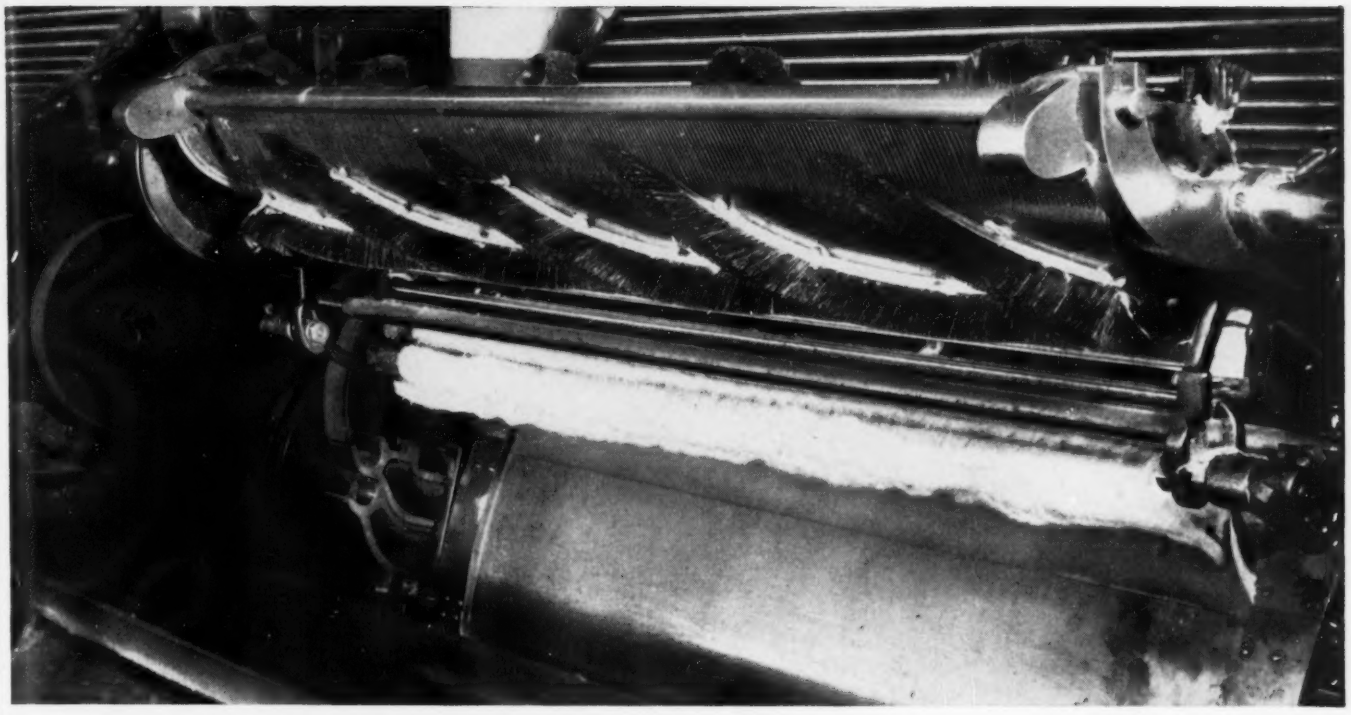
Electric trucks that may be used about mills and operated by women are discussed in a folder offered by Elwell Parker Electric Co.

Convertible air operated controllers are discussed in an 8-page bulletin, No. A112, issued by Bristol Co. Data is contained in this bulletin on five-types of controllers offered along with information on converting from one type to another.

Getting the Most from Winding is the title of a 35-page booklet issued by Universal Winding Co. This booklet contains the series of reprints entitled "Getting the Most from Winding" from issues No. 19 through 35. Detailed information is contained concerning adjustment and upkeep on the No. 50 winder, No. 90 winder, and the Roto-Coner. It should be of assistance to any winding room overseer.

Infra-red rays in the textile industry are discussed in a pamphlet issued by Fostoria Pressed Steel Corp., entitled "Near Infra-Red in the Textile Industry." Photographs showing the use of infra-red for drying of fabrics of various types ranging from installations on sanforized machines to those used for drying rugs, carpets and duck material are contained.

"Facing the Needs of Today" is the title of a folder published and offered by Wildman Mfg. Co. A sample of material knitted on Wildman multi-speed ribbed machines is also contained.



This is how a set of Fullergript Card Brush Refills looks ready to operate

When brush materials are gripped in Steel—like Fullergript—you have no worries about atmospheric temperatures affecting the brush materials or holding method—no tufts to fall out from splitting blocks or cement loosening.

That's why hundreds of flat cards in mills today use Fullergript, and are constantly replacing old tufted construction as fast as possible. These pre-formed spiral all-metal-back strips are easily attached to your present wood cores by following our simple directions.

Study the photograph above. There are longer bristles at each end of brush strip to clean the ends of the flats where there is no card clothing and keep them free of oil and lint. Our Brush construction packs material into a continuous, dense strip with no gaps to permit insufficient cleaning of the flat clothing.

Cleaner Top Flats Mean Better Carding

HERE'S THE INSTALLATION RECORD OF SIX MILLS IN SIX STATES. NAMES ON REQUEST.

STATE	TRIAL ORDER	MACHINES NOW EQUIPPED WITH FULLERGRIPT
Maine	6 sets	202 machines
Georgia	6 sets	114 machines
Massachusetts	2 sets	102 machines
South Carolina	2 sets	104 machines
Alabama	12 sets	139 machines
Rhode Island	6 sets	242 machines

Over 5000 Cotton Cards are in use today with Fullergript Replaceable Brush Strips. Why not investigate the economy and greater efficiency of these remarkable brushes? We are confident that if you will give them a trial on a few machines, you will want only Fullergript Brushes.

Many Carders started with trial sets of Brush Refills, and results meant building up to full installations over a period of excellent performance. These mills are not located in any one section of the country but spread over many States.

(Card Room at Manville Jenckes Corporation. Full complement of our Brushes on all cards.)

The FULLER BRUSH Company

3594 MAIN ST., INDUSTRIAL DIVISION 8C, HARTFORD, CONN.

NEW SYNTHETIC YARNS
with almost unbelievable qualities are promised for the future . . . which means that a machine involved in processing such yarns must have flexibility as its major characteristic.

In the past 20 years, the breath-taking advance of synthetic fibres was a tremendous test of the flexibility of the No. 50 Precision Winder. And the new problems of accurately controlling tension and pressure for many wartime requirements have provided a further demonstration of that flexibility.

This record clearly indicates that the Universal Precision Winder will be equal to the challenge of winding the *new* synthetic yarns promised for post-war fabrics.

wound on the 50... for chutes or chiffon

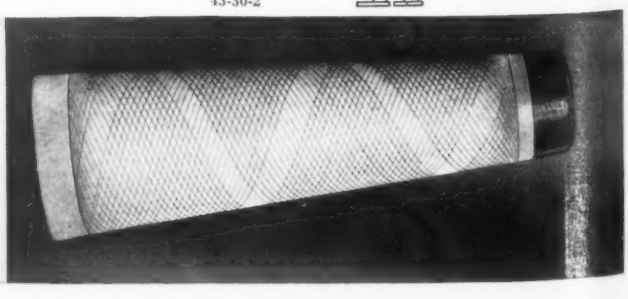
Universal Winding Company

LEESONA

PROVIDENCE
BOSTON
PHILADELPHIA
UTICA
CHARLOTTE
ATLANTA

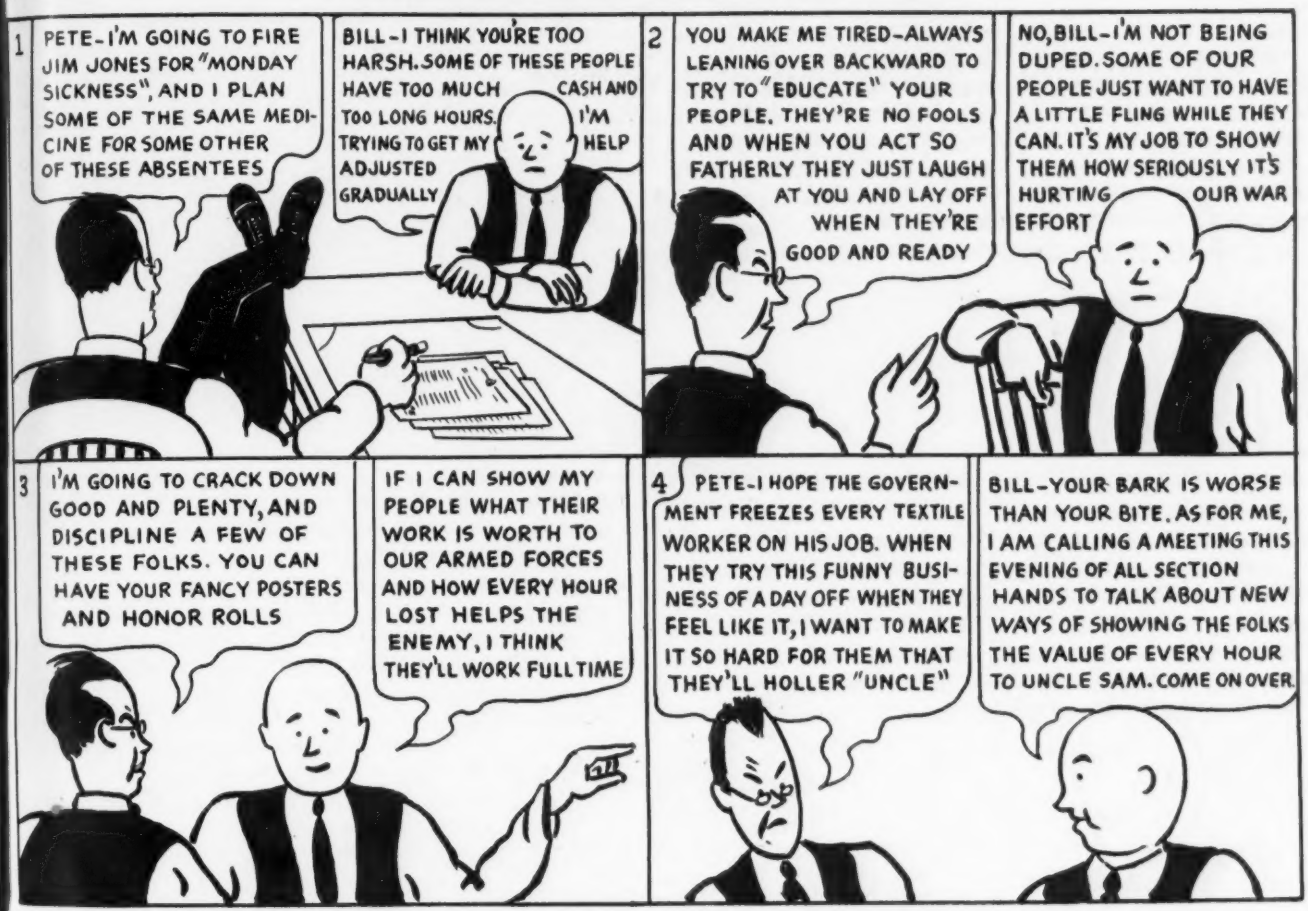
43-50-2

MORE THAN 90% OF ALL SYNTHETIC YARN IS PRECISE-WOUND ON THE FLEXIBLE 50



PETE & BILL

HANDLING ABSENTEE WORKERS


1
PETE-I'M GOING TO FIRE JIM JONES FOR "MONDAY SICKNESS", AND I PLAN SOME OF THE SAME MEDICINE FOR SOME OTHER OF THESE ABSENTEES
BILL-I THINK YOU'RE TOO HARSH. SOME OF THESE PEOPLE HAVE TOO MUCH CASH AND TOO LONG HOURS. I'M TRYING TO GET MY HELP ADJUSTED GRADUALLY
2
YOU MAKE ME TIRED-ALWAYS LEANING OVER BACKWARD TO TRY TO "EDUCATE" YOUR PEOPLE. THEY'RE NO FOOLS AND WHEN YOU ACT SO FATHERLY THEY JUST LAUGH AT YOU AND LAY OFF WHEN THEY'RE GOOD AND READY
NO, BILL-I'M NOT BEING DUPED. SOME OF OUR PEOPLE JUST WANT TO HAVE A LITTLE FLING WHILE THEY CAN. IT'S MY JOB TO SHOW THEM HOW SERIOUSLY IT'S HURTING OUR WAR EFFORT
3
I'M GOING TO CRACK DOWN GOOD AND PLENTY, AND DISCIPLINE A FEW OF THESE FOLKS. YOU CAN HAVE YOUR FANCY POSTERS AND HONOR ROLLS
IF I CAN SHOW MY PEOPLE WHAT THEIR WORK IS WORTH TO OUR ARMED FORCES AND HOW EVERY HOUR LOST HELPS THE ENEMY, I THINK THEY'LL WORK FULL TIME
4
PETE-I HOPE THE GOVERNMENT FREEZES EVERY TEXTILE WORKER ON HIS JOB. WHEN THEY TRY THIS FUNNY BUSINESS OF A DAY OFF WHEN THEY FEEL LIKE IT, I WANT TO MAKE IT SO HARD FOR THEM THAT THEY'LL HOLLER "UNCLE"
BILL-YOUR BARK IS WORSE THAN YOUR BITE. AS FOR ME, I AM CALLING A MEETING THIS EVENING OF ALL SECTION HANDS TO TALK ABOUT NEW WAYS OF SHOWING THE FOLKS THE VALUE OF EVERY HOUR TO UNCLE SAM. COME ON OVER.

Should employees who are absent from work without good reason be strongly disciplined, or should the corrective plan be one of education?

Letters from Readers

By All Means, "Written"

"Verbal vs. Written Orders," Feb. 1943

Dear Pete & Bill:

By all means, Bill, have those orders *written*.

This eliminates misunderstanding, makes every order clear, removes possible buck passing, and gives credit where it is due.

Paper work may take a little time, but it's worth it when you consider how much material can be ruined or damaged by a miscarried, or ill-remembered, verbal order. That direct order (*written*), with all specifications and details so clear and fool proof, removes chance for embarrassment, and having your ears blushed cherry red.

Paper is to put orders on anyway, and your brain should do your thinking instead of harboring so many details and orders.

LAMAR FOGEL (Va.)

A Message for the New Overseer

Dear Pete & Bill:

These remarks are for the new overseer on a new job. I am sure that you will get on all right if you will adapt yourself and perform all required duties faithfully. Apply the same standards of clear thinking and clean conduct that have up to now brought to you good health and happiness.

Say little, but do much. Keep that temper of yours always to yourself. No one else wants it! Try to boss yourself for a while. If you can do that successfully, you will probably be able to boss others.

To be really ready for an overseer's job is not a matter of an instant, but of weeks, and years. I have known young men who were promoted to an overseer's job and they thought that they were ready. But some have discovered they were not fitted for the chance they had been given. Then, unless they had the stamina to make up for lost time by learning the things about their job that they should have learned long ago, they had to admit

failure and go back where they started from.

In my own experience, the men who fill overseers and superintendents places have been thinking about that work all their lives, and have looked at it from every possible angle, getting all the information about it they could from books, textile magazines or other men. The man who goes into an overseer's place with the right training and self-confidence, will not lose his head.

UNCLE DAVE (N. C.)

"Sensible," the Standard for Women's Attire

"Attire for Women Workers", Mar. 1943

Dear Pete & Bill:

Choosing a uniform that is sensible is the answer to Pete's & Bill's argument, whether it be slacks and a sweater, a work uniform, or even overalls. However since women are performing so many masculine tasks, slacks seem to be the better answer.

Women are susceptible to good suggestions, and even though use of slacks is "putting pants onto the women," they appear neat and have a freedom of movement. As a morale-builder, they permit change to street dress that is clean and comfortable to go home in.

Trying to ram a compulsory uniform down the operatives' throats is bad practice. The "sweater-girl fad" may appear to some as sexy, but women being as they are, it doesn't pay to curtail their freedom in choosing their style of dress. But good suggestions are in order, will be well taken.

LOUIS F. (S. C.)

Pencil and Pad Helps

"Verbal vs. Written Orders," Feb. 1943

Dear Pete & Bill:

Well, Bill you remind me of one of my bosses in Reedville Mill. He looked just like you. Pete reminds me of my loomfixer in Great Harwood, Lancashire, England.

Yes, Bill and Pete I think you should carry a pencil and pad with you. With the war going on, you are both sure to forget something. For my part, it saves lots of time in not having to go back to the office to look things over. Besides it helps you keep up with your spelling and writing.

I am enjoying your Overseers Corner very much. I have your page right here, looking at you both, and having a good laugh at both of you. I will write to you later on as I don't have time to finish now. I am going to a first-aid class every Wednesday night from 7:30 till 10.

MRS. E. TOOLEY (N. Y.)

Verbal vs. Written Orders

"Verbal vs. Written Orders," Feb. 1943

Dear Pete & Bill:

Bill's dilemma with misunderstood or disregarded orders would seem to be a minor problem in these times, but I think this condition could be almost completely eliminated with the adoption of a few simple rules.

Instructions of any importance should be written by all means and in extreme importance should be signed for by the person receiving them. Invariably when a shift changes and a change in foremen is made, a list of instructions is handed from foreman to foreman, and no excuse can be made for failure to follow orders.

Some overseers have adopted a repeat system very successfully and require those who receive orders verbally, to repeat the order aloud in full. Misunderstanding is reduced to minimum.

R. M. H. (Mass.)

* * *

Lawrence (Mass.) Print Works has been recruiting labor from diversified local fields to operate a so-called "Victory Shift" for men with daytime employment elsewhere. These special employees, including attaches at City Hall, county workers and others, are among those doing their bit for the textile war effort by reporting at 5 p.m. for several hours employment.

Memories of Old Man Carelessness—By Martha Pittenger

No. 5—MISS GREENHELP

Who? Me got a sweetheart? Sure I have, for I have several pages filled with accidents I have caused Miss Greenhelp. I get a big kick out of the old saying that "In the spring a young man's fancy lightly turns to thoughts of love," for I can truthfully say that all green help fall in love with me during any season of the year and regardless of my age. They often remind me of a colt working themselves to death and getting nothing done; besides getting hurt and eating up the company's profit.

I remember very well one young girl who had just started to work in the weave room. I met her at the door and gave her a warm welcome; Miss Greenhelp and I were going to be great pals, for she followed my instructions perfectly. She must have heard of me before she came to work, for her dress was most unsafe—a big bow tied in the back to catch in the machinery, high heels to take a fall with, a ring on her finger to hook unexpectedly, her hair flying. I told her to get about fast, so the boss would think she was working hard. I didn't let her know that by being calm and steady she could accomplish more.

She started as a battery filler, and I am really surprised she lasted as long as she did without getting hurt. After she had narrowly escaped an accident several times, I suggested she roll the battery-head back to fill it, and luck was with me. Since the job was getting behind and she was all excited, she reached in a little too far. The quill changed, and her right hand got caught in the shuttle box, mashing two fingers badly, the two most dependable ones, which caused her to be out for several days.

After that I had to check her off my list of admirers since she had gotten wise to me. But I still have a legion of green help who think I am a grand old man.

KINKS & SHORT-CUTS

A $25 WAR BOND FOR YOUR IDEA

A $25 War Bond will be awarded each month for the most useful "kink" published in this department. This contest is open to all readers of TEXTILE WORLD, and there is no limit to the number of entries any one person may make.

Contributions must be received not later than the last day of the month to be eligible for the award for the second succeeding month. Items may pertain to production methods, mill engineering, safety, cutting costs, improving quality, speeding up production; in brief, any little device, stunt, kink, or short-cut which you have tried out in your own mill and which you believe will be helpful to other mill men. The items should be short, preferably not over 300 words. Previously published material is not eligible for the award. Judges of the contest are the editors of TEXTILE WORLD.

TEXTILE WORLD shall have the right to publish any item submitted. Items which are published will be paid for at our regular rate for this type of matter with extra payment for appropriate sketches or photographs. The sketch you submit need not be a finished drawing.

Contributions should be addressed to: Technical Editor, TEXTILE WORLD, 330 West 42nd St., New York.

Prolonging Life of Temple Rolls

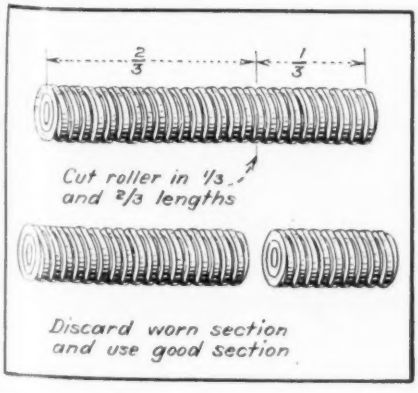
THIS MONTH'S PRIZE WINNER

Today everything possible must be done to prolong the usefulness of rubber temple rolls. Often temple rolls must be used which are worn, and which would not be considered entirely satisfactory under normal conditions. Here are three methods which I have employed to get additional use from worn temple rolls.

1. In numerous instances, the rollers wear down at one end or become grooved around the gripping surface at one end. I find that these damaged rollers often will give a few more months' wear if turned end-for-end.

2. Another trick for prolonging the working life of rollers which have become worn through use on sheers and other smooth weaves is to use them on twills or other rough weaves.

3. What has proved to be another excellent method of reworking temple rolls is to cut them into one-third and two-third lengths as shown in the accompanying sketch. The worn ends are discarded, and the lengths that are worn less are matched to form a full-length temple. When reworking double-roller temples, place sections so a one-third length is at one end of one roller, and a one-third length at the opposite end of the second roller. This prevents creases from forming under the rollers. H. E. Wenrich, *Berwick, Pa.*



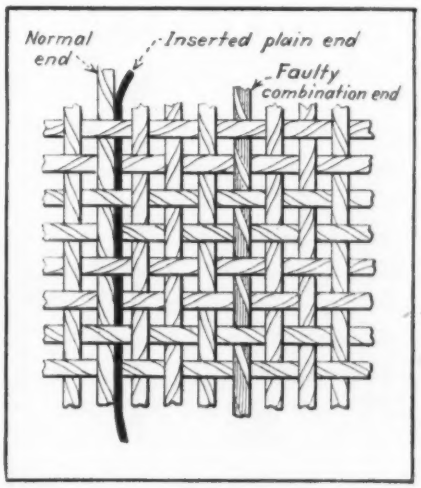
Method of reworking temple rolls to prolong their life.

Locating Faulty End At Loom

Suppose a warp consists of 100/40 viscose crepe and 150/60 dull acetate combination yarn, and someone accidentally inserted an end of 150/40 dull acetate. These two acetates have different dye indexes so that the faulty end will show as a fine line in the finished goods. Such goods, even in today's market, are seconds and, therefore, such an end must be removed at the loom. First the mixed end must be found.

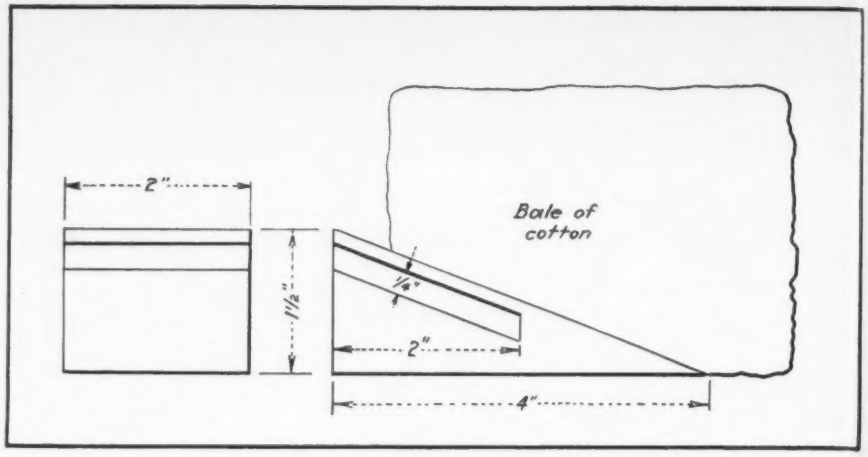
A test sample from the start-up of the warp can be dyed to show the approximate location of this faulty end. Due to the fact that the denier sizes of both the correct yarns and the mixed end are the same, it is very difficult to locate the mixed end, even with powerful magnifying glass.

The following method will greatly facilitate the location of a mixed end. Place the dyed test sample upon the gray goods on the loom close to the reed. Mark the spot where the faulty end appears with a pencil on the goods. Then pick a heddle about 1/8 in. from the mark toward the center of the



Method of locating a faulty end by inserting a marker.

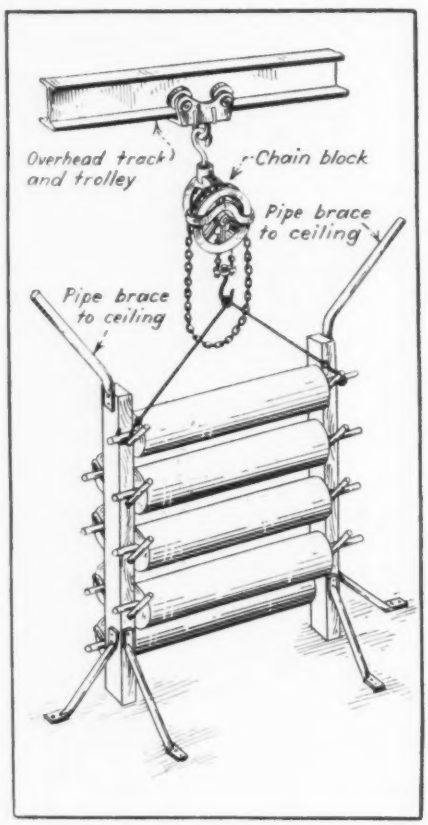
goods. Insert in this heddle and respective reed-dent a plain acetate or viscose end. (Do not remove the regular combination end.) The heddle now contains two ends. Now weave another test sample. Upon dyeing this sample, the plain end will naturally show up very pronounced, and it is an easy matter to count the ends between this plain end and the faulty combination end. Let us say there are six ends between the marker and the mixed end. Now on the loom count six ends over from the plain end and the seventh one is the faulty end. Another test-sample will show just how dependable this system is.—S.C.V. (*Pa.*)



Marker and tag holder for bales.

Vertical Beam Storage

One way of keeping warps out of the way and preventing them from being damaged is to construct a rack similar to the one shown in the accompanying diagram. This rack consists of a frame with braces at the floor and ceiling. On two sides of the upright posts steel rods are inserted at an angle, and the rods on each side are staggered in relation to the other. A chain block is swung above the two uprights and is used to lift the beams in place on these rods. This rack is very effective and is compactly arranged. Warps can be easily checked without having to take them from the racks. Warps that are intended for production can be lifted from the rack with the chain block without disturbing the others. This arrangement is particularly good where a large number of short warps are made up for samples, and, as every overseer of weaving knows, it is easy for such warps to accumulate all over the mill.—C.P. (*S.C.*)



Rack for storing beams.

Breaking In New Roller Chains

Many roller chains come to the purchaser with a coating of grease that is put on to prevent the chain from rusting. This grease is not a lubricant and, if it is not removed, it may prevent the lubricating oil that is used later from penetrating in between the pins and rollers where it is needed.

Immerse new roller chains in kerosene for several hours, then wipe off and dry as much as possible before placing the chain in the lubricating oil which is to be used with the chain in operation.

Many instances have occurred where chains not treated as recommended above have developed kinks shortly after being put into operation. These kinks could be straightened out only by completely dismantling the chain link by link, and it was found that none of the lubricating oil that had been so freely used on the outside of the chain had reached the inner surfaces of the pins and rollers. In fact these parts were bone dry.

This same treatment is also recommended for silent chains.—C.J. (*Mass.*)

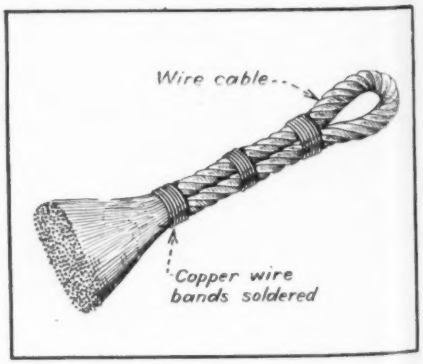
Cotton Bale Markers

Simple wedge-shaped markers for holding bale tags can be made to use in identifying cotton bales after they are opened and distributed on the picker room floor. The markers can be cut out of wood in any mill shop to the dimensions shown in the diagram. Paint blocks in colors to identify the bale by staple, grade, etc.

To use the blocks, the opener-room operator removes the bale tags, places them in the wedge slot, and then places block with tag under the correct bale. As the block is wedged shape, it is easy to insert under the end of the bale where it is out of the alleys and cannot be kicked around. Blocks remain under the bales until the cotton is entirely used; thus any irregularity in the cotton quality can be located with the assurance that bale markings are correct.—E.H.H. (*Mass.*)

Shop-Made Cleaning Brush

Until the war is over it is necessary to save all the critical materials we possibly can. One way to make good steel-wire cleaning brushes from scrap is as shown in the sketch. Bend ends of a short piece of old steel wire cable together, wind binder wires around them in bands, then coat the bands with solder. The brush ends are fanned out to provide bristles.—W.H.C. (*N.H.*)



Handy brush made from scrap wire cable.

FIXING HOSIERY MACHINES

CIRCULAR MACHINES—Chapter XXI—Belt Maintenance

By JULIAN W. HUGHES

CIRCULAR HOSIERY MACHINES are comparatively compact units and require only a small amount of power to drive them; consequently, a group drive in which a countershaft drives the machines individually by means of belts is still the most practical method of transmitting power to a battery of knitting machines. This means of power transmission is the simplest and oldest. However, the care and adjustment of such belts in knitting mills is often neglected.

Short-Center Drive

It is customary to drive two lines of knitting machines by a counter shaft extending along the floor halfway between two rows and driven by an electric motor through a short-center drive. The chain drive, the V-belt drive and the flat belt drive with pivoted motor base are frequently used. All these drives use endless bands that sometimes need adjusting.

Assuming that a chain drive is properly installed and enough oil is in the oil-tight case to keep the chain links well lubricated, it should give reliable service. About a pint of motor oil should be kept in the case and this oil should be drained, the case cleaned and refilled with new oil once a month. Sometimes it is advantageous to use an oil filter and filter the old oil so it can be used again. A chain drive of this type is frequently installed by the handy man of the mill who may not be as familiar with this kind of drive as he is with leather belting. In such a case it should be remembered that the slack side of the chain is run on the bottom side of the drive; just opposite to practice recommended in installing leather and flat belts. If the slack side of the chain is run on top it will likely "pinch;" that is, the teeth may catch in the chain links and jerk, perhaps sufficiently to break the chain.

V-belt drives should occasionally be checked to make sure that the bands are running smoothly. If the belt flaps it is almost invariably caused by slipping. The belts should always be kept taut, but not tight. Tests for slip should be made at no load and full load, and not over 5% difference in speed of motor with fully loaded countershaft should be allowed. Motors should not be blown out while in operation, for the grit and grime off the motor windings will likely cling to the belt surface and act as an abrasive. Sometimes the fixer's workbench is placed over the motor and driven pulley of the countershaft to save space and serve as a guard for the drive. Frequently an oil can will be left setting on the bench over the V-belts and surplus oil from the can will drip on the belts. Oil will accelerate belt wear. In such instances the work bench should be covered with tin or zinc and beaded to prevent oil from dripping to the floor.

A flat belt drive with a pivoted base motor should give little, if any trouble. The same precautions should be taken as if a V-belt drive is used. If the belt is leather it should be given a liberal application of neatsfoot oil, castor oil, or a combination of both once a week if the drive is in operation 16 hours a day or longer; and once every two weeks if in operation only one shift a day. The pulley side of the belt should be cleaned at regular intervals and in the same manner that machine belts are cleaned, the frequency depending on local conditions.

Machine Belting

Slippage of belts that drive knitting machines and vibration in machines caused by improperly adjusted belts may be reduced if the belts are, preferably, leather of double thickness cemented to form an endless band and tight enough to prevent flapping or "chasing," the driving and driven pulleys. If a single-thickness belt is used the grain side should be run next to the pulley and the metal fasteners should be as light as possible to reduce centrifugal force to the minimum. If too great, centrifugal force will cause vibration of the machinery.

Oak-tanned leather is still the most common type of leather belting used to drive circular hosiery machines. Double leather belts are made by cementing the flesh side of two thicknesses of belts together and leaving the hair or grain sides on the surface. Since a double thickness belt lends itself more readily to cementing to form an endless band, it is more desirable than other types. However, the double belt is not so easily adjusted as the single belt coupled with a metal joint, but once the endless belt is set at the proper tension, provided it is kept reasonably clean and pliable, it will run much longer and with less vibration.

The belt should be tight enough to drive the tight pulley on the machine at about 95% of its theoretical speed—a small amount of slippage being desirable to absorb shocks peculiar to the machine. Since a hand transferred machine stops and starts at the completion and beginning of each garment, the driving belt should be kept tighter on this type of machine than a belt on the automatic knitting machine. Also, when setting a machine in place, the driving pulley on the countershaft and the pulleys on the machine should not be out of line as this will cause the edge of the belt to drag against the shifter fork.

After the initial tension of the belt is established the next important step is to keep slippage at a minimum, the leather flexible and the surface exposed to the pulley clean. Three good ways of keeping the leather flexible are with castor oil, neatsfoot oil and melted beef tallow. If these oils and fats or a suitable belt dressing are not applied to the leather at regular intervals, it will dry out and crack and will not follow the pulley face sufficiently to prevent excessive power loss. Furthermore, when a leather belt begins to crack it isn't long before it will start breaking in various places. Mineral oil, however, should never be used on leather belting because it will eventually rot the material. Lint and grime adhere to the pulley-contacting surface of the belting and should never be cleaned or removed with a wire brush or similar sharp instrument. The writer has found that a piece of automobile tire casing held firmly against the belt while it is running is effective in removing accumulation.

Navy May Replace Khaki with Gray

THE NAVY announced plans on April 16 to adapt its summer clothing to the needs of modern warfare by substituting slate gray for khaki. The order provided only for gradual change from officers' khaki to slate gray, but most or all of the personnel may eventually be affected. On May 5 the Navy announced that khaki uniforms may be worn by officers as long as present supplies are

Officers were authorized to wear gray uniforms ashore and at sea from now on, but cloth stocks will not amount to much for some time. An attempt is being made to dye existing supplies of khaki to a passable regulation gray but results are called unsatisfactory.

Navy khaki is 8.2 oz., regulation for Army also, and any excess Navy stock due to increasing supplies of gray, could be transferred to the QM, although Navy has not officially expressed any such intention. Reliable sources indicate that the shift to gray may eventually include enlisted men as well as officers, totaling nearly 2,000,000, on a long-range basis.

Designation of uniform is subject to unit command orders. Any color that is needed for security, or any construction to meet weather conditions can be ordered. No doubt both white and khaki will continue to be worn in limited amounts.

Officers ask that there be no discussion of clothing now worn by sailors on sea duty, but it can be said that the slate gray program might eventually include the work uniform of enlisted men.

If you are any good as a table-cloth strategist you can figure out that the change to gray is due to new styles in sea warfare. Combat ships used to stand miles apart and shoot at each other. Now they are attacked at close range by airplanes whose pilots are gunning for *men*, who should therefore be as invisible as possible.

ANOTHER NEW GROUP of fabrics is to be found in the uniforms for lady leathernecks. The enlisted personnel work uniform is a comfortable, trim, white and green striped seersucker dress with turned down collar and breast and hip pockets. Officers will have a white cotton gabardine dress uniform cut like the seersucker work uniform. It will have gold buttons, gold and silver insignia, and with it will go the green gabardine summer hat and bag. No decision has been reached about dress uniform for enlisted personnel.

Officers will wear a green cotton gabardine hat similar to the winter one but with white cord. Enlisted personnel will wear a round-brimmed cap much like that now worn by enlisted WAVES, but of green cotton fabric with white pearl buttons.

Uniforms, hats and bags for both commissioned officers and enlisted personnel can be washed, which is considered important since many of the girls will be stationed in remote sections where dry cleaning would be out of the question.

Specifications for these uniforms have not been released yet.

Hosiery Simplification Workable

A TRIPLE PURPOSE inspired the conservation and simplification program affecting hosiery constructions recently enacted by WPB's Order L-274, effective May 15: 1. Elimination of the poorer-wearing hosiery, thus giving longer periods of service to the consumer per item produced; 2. Conservation of cotton, rayon and wool yarns by limitation of certain usages which do not add to the life of the hosiery; 3. Development of maximum production through most efficient use of existing facilities.

Comment in the industry is to the effect that Order L-274 is reasonable, will attain to some degree the objectives announced by WPB, and requires only minor clarification or modification. WPB estimates a yarn saving of 14,800,000 lb. annually—some in the industry seem to feel that this is an exaggeration. Also the volume of poor-service items eliminated by the order is regarded as not in itself particularly large, but as nevertheless worth getting rid of.

In the important full-fashioned branch the principal change is elimination of the ultra-sheer hose of ordinary 50 den. rayon and its replacement in part by hose made of 50 den. semi-high-tenacity yarns. Skimping in reinforcement at heel, toe and welt is prevented by specifications which set certain minima as, for example, a minimum of 4 in. (with maximum of 5 in.) is set for the splicing or reinforcement of the heel. Lengths of hosiery, depths of welt, etc., are specified. Two or three-ply yarns must be used for seams with a minimum of 16 stitches to the inch. Certain fancy welts are prohibited, but lace, mesh and run-proof numbers are not affected. Nor is there restriction on cotton, wool, spun-rayon, or combination-yarn goods in full-fashioned construction. Minimum denier and twist of rayon is set for use in the legs of various gages of full-fashioned hose. Women's seamless goods are similarly regulated.

The principal yarn saving in the order is introduced by limitations on men's, misses', children's and infants' hosiery. For the most part sole-splicing yarns are prohibited, double-turning welts omitted, and cuffs are permitted to be folded only once. The industry believes sole reinforcement should be permitted on rayon and wool items. No limit was put on the lengths of half-hose—a matter which had been under consideration in the discussion leading up to the order. There are, however, limitations on sizes for certain types, as for example, children's half-socks cannot be made larger than size 7½ compared with sizes up to 9 in some lines.

In fancy half-hose, patterns are limited to those actually produced in any one mill during the 60-day period preceding March. There is no limitation on the colors of various yarns used for decoration, but the body of the hosiery is restricted to seven basic colors, no more than five of which may be used in any one style. A similar color restriction applies to full-fashioned.

The restrictions on men's hosiery do not apply to work socks or bundle goods; neither do they apply to any hosiery made for the armed forces, Maritime Commission and War Shipping Administration.

The consumer-press hailed the simplification order as a move to get longer-wearing hosiery to the consumer. This is only true to the extent that some of the less serviceable combinations of construction and yarn-size will no longer be made.

QUESTIONS & ANSWERS

Looms per Fixer

Technical Editor:

We wish to know your opinion on the number of looms a loomfixer can look after. No doubt this will be determined to some extent by the material being woven. At present we are on woolen blankets and our looms are 92 in. W-2, Crompton and Knowles Automatics. Our blankets weigh about four pounds when finished. On this set up, how many looms can a loomfixer take care of?

In the near future we will convert to the making of tweeds. Would the number of fixers change? We will be pleased to have your reply to these questions. (8895)

The number of looms a fixer can look after depends largely on the fabric woven, the equipment used and the amount of help given the loomfixer. The number of looms to a fixer in different woolen mills weaving blankets varies from approximately 20 looms to as high as 28 looms. The majority of mills have fixers operating 24 looms to a section.

Picks per inch in the fabric also have a bearing on the matter. Low pick work will run out faster and more warps will have to be put in the looms. On woolen work the fixer spends considerable time putting in warps. Some mills are equipped with large flange beam heads which allow a greater number of cuts to be dressed on a beam.

The amount of help given a fixer largely determines the number of looms he can handle. If warp men are used to put in the warps, a fixer relieved of this work can take care of more looms. Some mills have less looms to a section but require the fixer to put in his own warps.

Other mills have more looms to a section, but the fixer only helps with the warps when he has no other work.

In order to determine the number of looms to a section, all the factors mentioned must be considered.

Changing to the weaving of tweed would probably not affect the number of looms to a section.

Common Defects in Cotton Manufacturing

Technical Editor:

I would like a list of a few of the most common defects found in work from cotton picking, carding, drawing, spinning, twisting, and slashing, what causes these defects, and how to prevent them.

I naturally expect this information to be very brief, in that I realize if it were to be in detail, it would fill a volume. Just a few of the most common defects will suffice. (8879)

Defects caused by faulty equipment, use of improper stock, etc., are so numerous and varied that it is impossible to list all of them. However, given below are some of the most common defects and preventive measures to be taken.

Picking

Off-weight laps-dirty evener pedals. Irregular feeding. Slack cone belt. *Prevention*—Clean pedals and bars. Maintain level in hoppers. Replace cone belt.

Waste in laps—Dirty cages and beater chambers. *Prevention*—Clean cages and chambers every 4 hr. Drop dust box every 2 hr.

Carding

Neppy web—Dull wire. Improper settings. Too infrequent stripping. *Prevention*—Grind more often. Check settings. Strip more often.

Variation in sliver weight—Split laps. Bad piecings when creeling. Light sliver after stripping. *Prevention*—Check on setting of split lap preventors on pickers. Avoid too much reworked waste in mix. Run sliver on floor after stripping and before piecing.

Drawing

Clearer waste in work—Dirty or poor nap on clearers. *Prevention*—Pick clearers every 2 hr. Use wire brush to raise nap on clearer.

Oily Sliver—Dirty roll necks or coiler plates. *Prevention*—Use more care in oiling top and bottom rolls. Wipe coilers plates after oiling when doffing.

Roving

Single or double—End breaking back in creel. Poor piecings. Broken end running in other end. *Prevention*—Sharpen skewers. Forbid long tails when creeling. Remove all single or double yarn bobbin before piecing up.

Clearer waste—Dirty or bald clearers. *Prevention*—Pick oftener, replace or raise clearer nap with wire brush.

Spinning

Coarse yarn—Long tails when creeling. Double roving from carding. Three ends in trumpet. *Prevention*—Insist on end to end piecing when creeling. Inspect for double roving and wrong ends in trumpets.

Oily Yarn—Oily roving. Oily roll necks. Careless oiling. *Prevention*—Inspect creels for oily roving. Wipe necks. Use oil can with small hole.

Twisting

End missing—Break back. Slip knot. *Prevention*—Check knots on creels. Inspect knot tier on spooler.

Soft twist—Slipping band or tape. *Prevention*—Replace or check on tension. Wipe whorl.

Slashing

Hard size spots—Stopping cylinder. *Prevention*—Run cylinder slowly instead of stopping.

Oil marks on warp—From oily warp yarn or roving. Oily spots or waste on rolls or cylinder. *Prevention*—Inspect beams for oily spots. Clean rolls and cylinders.

Weaving

Oil spots—Generally from battery oil, or gear splattered oil. *Prevention*—Use stainless oil or more care in oiling.

Piece-ups—Poor piecing of warp yarn. *Prevention*—Instruct weavers and return all poor piece-ups from cloth room inspection.

Finishing Tricot Fabrics

Technical Editor:

Will you kindly outline the method of finishing tricot material? We believe this type of fabric is going to be used more extensively in the future and, therefore, we should like to know how it is finished and what types of equipment are employed. (8893)

Finishing of tricot does not differ in principle from the finishing of other types of knitted fabrics. That is, practically the same scouring, bleaching, dyeing, and finishing treatments are applied. However, there are a few differences in the type of equipment employed.

In the first place, it is usual practice to tack together the selvages of the tricot material before it is subjected to any wet finishing processes. Formerly, selvages were tacked by hand, but common practice today is to use a tacking machine.

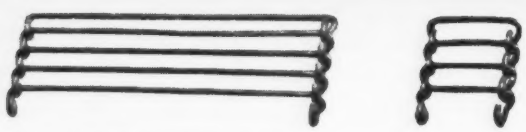
Scouring and dyeing are usually carried out in the same equipment. This is a reel type dyeing machine similar to that used for rayon knit goods or rayon woven fabrics. Preferably the

YOU NEED CONDITIONED WATER

★ Wherever there is a boiler, wherever soap or soda are used, wherever water is heated . . . you need conditioned water. Write for catalog of Refinite water softeners, filters and iron removal units. The Refinite Corporation, 101 Refinite Bldg., Omaha, Nebraska.

Opportunities...

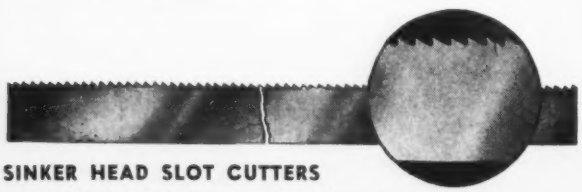
TO IMPROVE YOUR PRODUCT AND SAVE YOUR MONEY...



NARROWING CHAIN

Accurately made from high grade material—built to last and to hold its shape.

Send for bulletin giving full details on these and other products.



SINKER HEAD SLOT CUTTERS

The ideal tool for cleaning out slots in sinker and divider heads. Made in all gauges. Each one comes in a leather carrying case.

THOMAS & SKINNER
STEEL PRODUCTS COMPANY
1119 East 23rd Street Indianapolis, Indiana

dyeing machine should be constructed of Monel metal or stainless steel.

After dyeing, the goods are hydro-extracted.

They are then dried to the correct width on a pin tenter. Formerly, hand frames were used for drying, but today pin tenters equipped with special drying units are employed. Quite frequently the tenters are equipped with a selvage clipping device at the delivery end.

Finally the goods are doubled and folded.

Sizing Acetate Warps

Technical Editor:

We wish to inquire as to the type of sizing you recommend for 150-den. Celanese acetate dyed Chloro-Cross, for warps. We understand that the natural acetate contains about 2% oil. During the dyeing process this oil is removed. Do you recommend the replacing of this 2% oil after the natural yarn is dyed for use in the warp or is it best to have the dyed yarn sized without replacing any of the original oil whatsoever. Will such yarn, free of any oil, after sizing, not prove brittle.

We need this information for our weaving trade. Our suppliers have been furnishing yarns mostly to the knitting trade. The knitting trade requires yarn with an oil content which we know is excessive for the warp use. (8901)

It is always advisable to add some oil to the slashing solution, whether raw or dyed yarn; in fact it is essential to have this oil for lubrication purposes. A slashed end without any lubricant will shed its size during the weaving operation and thus lose the protection, which after all is the purpose of slashing. Goods woven without oil will also have a harsh hand, since this type of fabric receives very little finishing after weaving, and in most instances is ready for the market as it comes off the loom.

Another reason for including oil into the slashing liquor is, that by its addition the gelatine percentage can be increased for better weaving performance without producing a harsh fabric.

There are several good sulphonated oils on the market which will give the necessary pliability to the yarn, using them in the ratio of about 5 to 6 lb. to 15 to 16 lb. of gelatine. A little experimenting will be necessary, as the proper composition of any slashing solution depends upon the count and pickage of the fabric, and in jacquard weaving, also upon the design, since a pattern with many taffeta binders naturally abuses the warp more than longer floating interlacings. In addition, the atmospheric condition of the weave shed further influences the amount of size necessary for efficient loom performance.

HOW YOU CAN INSURE MAXIMUM TENSILE STRENGTH OF WOOL FIBERS

USE LEVANA IN THE DYE BATH

Soldiers, sailors, marines are tough on equipment. Think of the "wear and tear" your government woolens must undergo in the service of the armed forces! To insure *maximum* strength — add Levana to the dye bath. This *original* Sandoz formula protects wool fibers against the action of alkalies . . . steps up the tensile strength of the finished fabric!

Levana prevents felting and shrinking . . . preserves the "soft hand" of fine woolens. Economical and easy to use . . . Levana is readily soluble in water. Long used by leading textile mills, today Levana is in greater demand than ever — when military requirements call for greater wear and durability in every yard of government goods.

IMPORTANT NOTICE!

DYERS OF RAW STOCK

✓ Levana improves weaving efficiency

Insures highest tensile strength

DYERS OF YARNS and PIECE GOODS

✓ Levana improves level dyeing

Increases tensile strength

Prevents felting and shrinking

Only Sandoz Makes Levana

Write today for a WORKING SAMPLE OF LEVANA. Also ask for Catalog No. 33-A. Or — if you have a specific problem that calls for "on-the-spot" action — Sandoz technicians are available to visit your mill. They are in a position to benefit you by the experience gained in years of plant work.

SANDOZ

SANDOZ CHEMICAL WORKS, INC., 61-63 Van Dam Street, New York, N. Y.

BOSTON, MASS. • CHARLOTTE, N. C. • PATERSON, N. J. • PHILADELPHIA, PA. • PROVIDENCE, R. I. • CHICAGO, ILL. • LOS ANGELES, CALIF.

NEWS OF THE MONTH

Military Rayon Needs Rise Sharply

Army and Navy needs for rayon products other than garments are rising rapidly. Air forces, Ordnance, Chemical Warfare and Army Engineers are calling for more rayon. The Navy finds the yarn is not only replacing silk and flax for many uses, but it is possible to develop entirely new military cloths for modern warfare from it. It is expected that more and more uses will be developed.

Further orders for rayon for six different types of parachutes are expected to be placed by the Army and Navy within the next few weeks, calling for more fine deniers in high strength rayon yarns. Standard 300 denier rayon yarn will be used for making tapes for some types of chutes. Recent purchases of these chutes alone will consume several million pounds of high tenacity rayon.

Heavy yardage of fragmentation and flare chute cloths, tow target cloth, flare chute cloth, etc., is demanded by the military. Electrical insulation work calls for high tenacity yarns. But all these increasing uses for rayon may be only a small fraction in poundage compared with mounting demands of the Army for rayon for tires.

The industry in 1942 produced about 50,000,000 lb. of h. t. rayon without any conversion. Late in 1942 a conversion program was ordered to increase capacity by another 50,000,000 lb. annually. Now a second conversion, in the talk stage and not yet official, would bring annual capacity to 150,000,000 lb. Total annual rayon capacity of all types is about 632,000,000 lb. Presumably additional capacities for production of military types will be by conversion, and not by additional plant, except in some extreme cases.

There is now no indication that early action will be taken on the proposed program of rayon cloth simplification.

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Government Has Bought Domestic Clip

Department of Agriculture's order under which Commodity Credit Corporation is purchasing the entire domestic wool clip of the current season became effective April 24. It was estimated that dealers had contracted from 50,000,000 to 90,000,000 lb. of the total 390,000,000 lb. clip before Government buying began. Object of this "evasion" as some officials called it, was to save 1½¢ or so under CCC charges for grading and for risk in guaranteeing ceiling prices; to insure against delayed deliveries they expect will result from Government controls; and because loopholes in the order enabled them to get away with it. The Department of Agriculture made a move to issue an order to stop the private buying, but did not follow through.

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Absenteeism Caused Loss Of 422,700,000 Man Days

Absenteeism during 1942 resulted in the loss of more than 422,700,000 man days in American industry, an increase of 72,000,000 man days over the loss in 1941, according to Conference Board. This does not include time lost from industrial accidents or approved leaves of absence.

OFFICE OF QM GENERAL has set up a permanent display of 3,000 items at a central headquarters in New York, and it is offering to help small mills to obtain contracts. At the opening are shown above, from left to right, Maj. Gen. Clifford L. Corbin, director of procurement, Office of Quartermaster General, George A. Sloan, Commissioner of Commerce at New York, and Lt. Col. William R. Stanert, QMC, Officer in Command.

Compiles Manpower Information

The Cotton-Textile Institute has started for its members a new information service, involving a compilation of official orders, regulations, directives, etc., relating to the war manpower situation and Federal control of wages, salaries and other conditions of employment. In a letter accompanying the compilation, Dr. Claudius T. Murchison, president, states that it is the Institute's purpose to keep this information service up-to-date by sending to members further material, as issued, bearing on these subjects.

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Substitute for Raw Cotton Ceilings

In an effort to stabilize the price of cotton and to make price ceilings unnecessary, at least for some months, OPA and the War Food Administration are allowing the Commodity Credit Corp. to offer for sale not more than 300,000 bales a month of its stock of cotton. Prices when adjusted for location differentials correspond to those prevailing on April 7, the day before the issuance of the President's hold-the-line order. On April 7, the 10-market average for ⅞-inch middling was 21.38. Besides the sale of Government cotton, the program provides for calling of CCC loans on long-staple cotton.

It was announced that immediate steps would be taken to prepare a permanent price regulation for raw cotton to supplement, if and when necessary, the ceilings established by sale of CCC cotton. Such steps may not be required. If, prior to the completion of the permanent regulation, the

prices of raw cotton exceed the general ceiling levels at which CCC stocks are being made available, a temporary maximum price ceiling may be issued. Government authorities expressed the opinion that it is highly doubtful if even temporary ceilings will be needed.

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Lend-Lease Textiles Go to North Africa

In the first four months since the invasion of Africa, Lend-Lease reports that 126,184 tons of food, clothing, medicines and other necessities of life were shipped to North Africa, including textiles worth $6,400,000, and clothing worth $3,000,000. The shipments had a total value of $26,250,000. All of the supplies were sent for the use of civilian populations.

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S. T. A. Postpones Annual Meeting

The Southern Textile Association, through its board of governors, has decided to postpone its annual meetings until more favorable conditions exist. Current officers will be retained until an annual meeting takes place, at which time an election will be held.

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Hearing on Reciprocal Trade Act Extension

Hearings by the House Ways & Means Committee on the proposed renewal of the Reciprocal Trade Agreements Act, brought a number of textile men to Washington. The wool industry vigorously opposed renewal. Arthur Besse, president, presented a brief for the National Association of Wool Manufacturers in which he opposed renewal, and urged cancellation of treaties already made, on many grounds including the damage alleged to domestic industry by cut rates and the need for complete flexibility of position after the war. The National Association of Manufacturers, represented by one of its directors, E. H. Lane,

AT ANNUAL MEETING of Alabama Cotton Manufacturers Association: from left to right, Dr. C. T. Murchison, president, Cotton-Textile Institute; Miss Bonnie Beth Byler, "Maid of Cotton", who spoke at luncheon; D. H. Morris, Jr., newly-elected president; and J. Craig Smith, retiring president and now chairman of the board of directors. Story of meeting appears on page 95.

QUERY: What is DRAX?

FACT: DRAX is a stable, aqueous emulsion of wax, aluminum salts and emulsifying agents.

QUERY: Why has it such high water-repellency and stain-resistance?

FACT: Because of a special method developed by S. C. Johnson & Son of making the colloidal particles extremely small and uniform in size. Much better impregnation of the fibres is the result. Application is uniform throughout the entire run of cloth.

QUERY: Is it easy to apply?

FACT: Yes. Simply dilute DRAX with ordinary water. Apply in a single bath, in any available type of padder. Temperatures may vary from room temperature to boiling. DRAX may be used on vat or sulphur-dyed textiles. Its acidity (pH 3.5 to 5) requires a minimum of control.

QUERY: DRAX users?

FACT: Textile manufacturers making army and navy uniform cloth, material for work clothes . . . as well as fabrics of all kinds for civilian life.

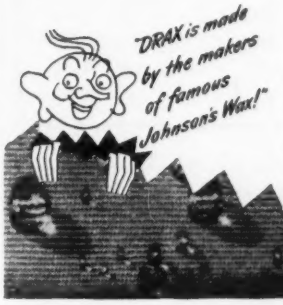
QUERY: What about MILDEW?

FACT: DRAX formula 1860PMA contains sufficient quantity of phenyl mercuric acetate to provide a mildew-proofing which meets the microbiological test for *chaetomium globosum.*

QUERY: Any other important facts about DRAX?

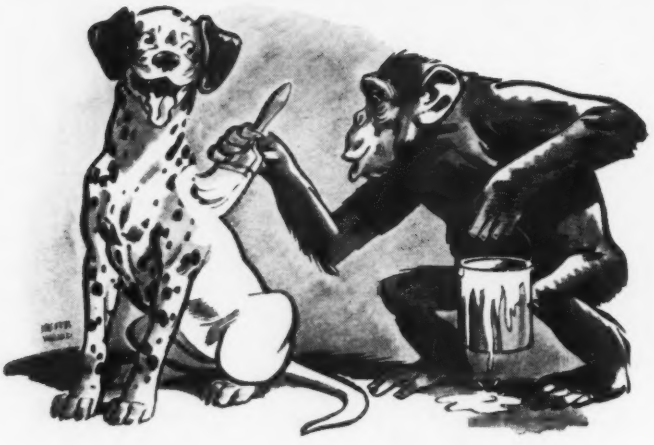
FACT: Yes. DRAX meets the water-repellent requirements of certain Quartermaster textile specifications. Its high water-repellency helps improve hand. It is economical to use. Requires a minimum of regulating with organic acids during application.

Write for the facts about DRAX. Simply address:



S. C. JOHNSON & SON, INC.
Industrial Wax Division
Dept. TW-53, Racine, Wisconsin
Buy U. S. War Bonds and Stamps

EXTRAORDINARY



How DEVOPAKE hides and covers any surface *in just one coat!*

And in these extraordinary times it is just the paint you need to improve **seeing** conditions by properly diffusing all the light available. Devopake boosts morale, jacks-up efficiency at small cost in time and money . . . with no waste of man hours or materials . . . with the least interruption of essential activities.

Devopake is the outstanding answer to your painting problems because:

DEVOPAKE covers more surface per gallon.

DEVOPAKE hides solidly — in one coat — over any type of interior wall surface.

DEVOPAKE'S big-brush workability (or easy application by spray) puts it on quickly, evenly.

DEVOPAKE is a self-sealer and finish-coat in one. It eliminates usual under-coat . . . saves man hours.

DEVOPAKE'S toughness enables it to stand up under hard wear and repeated wash-downs.

DEVOPAKE now comes in 7 practical, ready-mixed colors.

Specify Devopake on your next paint job and save time . . . save money . . . enjoy complete, guaranteed satisfaction.

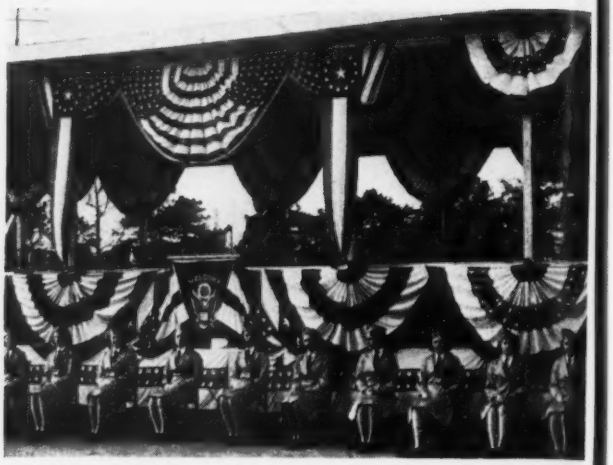
Devoe's maintenance paint line is built to meet all your requirements including high resistance to fungi, fumes and moisture.

Write us today for complete information that can help you solve your maintenance paint problems.

DEVOE & RAYNOLDS CO., INC.

The 189th Year of the Oldest Paint Maker in America

FIRST AVENUE AT 44TH STREET, NEW YORK, N. Y.



MILLS MILL, Woodruff, S. C., receives the "E" award. Above Olin D. Johnson, Governor of the State is addressing the employees prior to the presentation. Two other mills of the Reeves Bros. group also received the "E". These are Fairforest Finishing Co., Spartanburg, S. C., and Mills Mill, Greenville, S. C.

favored extension of the program but with limitation that only one-tenth of the permissible tariff reduction be made in any one year, and that the effect of the most-favored-nation clause on imports from other countries must be considered in negotiating any particular agreement. John L. Coulter, former tariff commissioner, told the committee that the trade pacts were killing the foreign market for American textiles and fibers and in addition the Government is losing $100,000,000 in revenues each year.

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More "E" Awards to Textile Mills

Textile companies which have been judged as qualified to receive the Army-Navy "E" award not previously mentioned in these columns include the following:

Gossett Mills, Anderson, S. C. (four plants—Riverside, Ladlassie, and Toxaway at Anderson and Pendleton at Pendleton).

Barnhardt Mfg. Co., Charlotte, N. C.

Peerless Woolen Mills, Rossville, Ga.

Frank Ix & Sons, Inc., Charlottesville, Va., and New Holland, Pa.

New England Tape Co., Hudson, Mass.

Proximity Mfg. Co., Greensboro, N. C.

Revolution Cotton Mills, Greensboro, N. C.

Aragon (Ga.) Mills Division, A. D. Julliard & Co.

Cole of California, Inc., Vernon, Calif.

Hawley Products Co., St. Charles, Ill.

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Textile Developments In Wartime Packaging

Cotton, paper, plastics, and foil, fused into one, are protecting airplane parts, guns, and machine parts being sent to the fighting forces overseas. At the exhibition of the Wartime Packaging Conference and Exposition held at Hotel Astor in New York, April 13 to 16, under the auspices of American Management Association, several such packaging materials were in evidence.

A notable example of new uses for cotton is to be found in a packaging material produced by Shellmar Products Co., and suitable for a variety of uses. This 3-ply material consists of a backing of cheesecloth, 30-lb. Kraft paper and lead foil, and all are fused together. Each serves

The Jacket that Won the Soldiers' Hearts

The Army Field Jacket was officially issued for field service.

But, comfort and military appearance promptly made it the favorite "all-around" jacket of the Army personnel.

Designed to give maximum protection with minimum bulk—our fighting Yanks soon discovered its added advantages in action.

These wind-resistant, water repellent O. D. jackets are made of a light weight poplin fabric and are lined with wool to give added warmth.

On the application of water repellents to Army Field Jackets and similar military fabrics, Butterworth Padders have a full-time job to do.

Butterworth Machines are serving at every step in the wet finishing of textiles for Uncle Sam—bleaching, boiling-out, drying, calendering, dyeing.

With equipment working overtime and little opportunity for replacement, mill superintendents must be on the alert to detect the first sign of let-down in quality and quantity of production.

All of our facilities not required for Ordnance production are available to help you solve your finishing problems... Let us serve you now.

H. W. BUTTERWORTH & SONS CO.
Phila., Pa. Serving the Textile Industry since 1820
Offices in Providence, R. I. and Charlotte, N.C.
In Canada: W. J. Westaway Co., Hamilton, Ont.

***64%**

of equipment now in use in the wet end of textile finishing cannot operate at a profit in competition with modern machines.

*Proved by Research

Butterworth

PRODUCING GUN MOUNTS FOR THE UNITED STATES ARMY

Obermaier

REG. U. S. PAT. OFFICE

Package Dyeing Installation, Extracting and Drying in a complete cycle on the same material carrier

•

Builders of

Cotton & Wool Dyeing Machines

for

Beams • Packages • Rawstock • Skeins

•

Centrifugal Extractors and Driers

•

Centrifugal Pumps

•

Rayon Cake Dyeing Machines

•

Dye Spindles and Perforated Tubes

☆

STAINLESS STEEL CONSTRUCTION

All Subject to Required Priorities

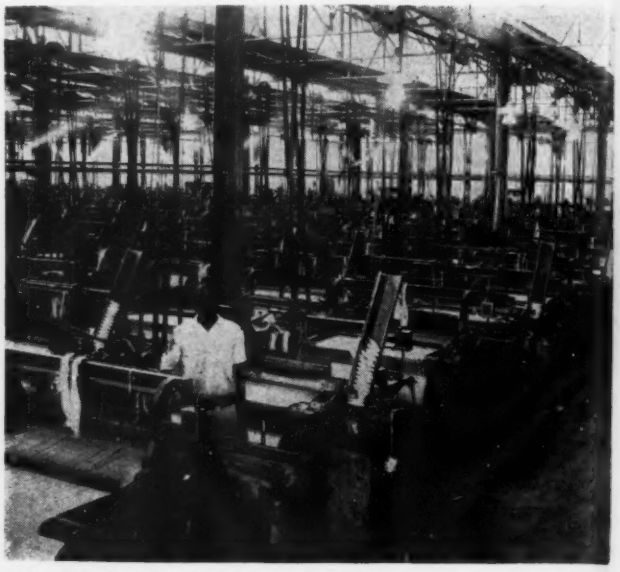
☆

Standard Fabricators

INCORPORATED

355 WALTON AVENUE • NEW YORK, N. Y.

Replacement Parts For Existing Machines Can Be Furnished



USINES TEXTILES, of Leopoldville, Belgian Congo, is one of the few complete textile organizations of Tropical Africa. Picture above shows its weave shed which is running on tent fabric, khaki goods, surgical materials, etc. An order for the complete equipping of this mill so far as loom harnesses is concerned went to the Steel Heddle Mfg. Co., Philadelphia, Pa. Under Lend-Lease plans textile industries in other countries may be recipients of American equipment.

a purpose. The cotton provides strength; the paper makes a waterproof membrane, which also acts as a heat insulator; and the foil prevents moisture transmission.

Another packaging material displayed at the Conference, produced by Celanese Celluloid Corp., consists of a cotton backing for strength, Kraft paper, and Lumarith, which is a plastic. This material is frequently wrapped about parts to make a waterproof wrapping. When fabricated into long narrow envelopes, it makes a waterproof case for shipping guns overseas.

Packaging of textile products such as hosiery and like items of women's apparel were featured, but no radical developments were noticeable.

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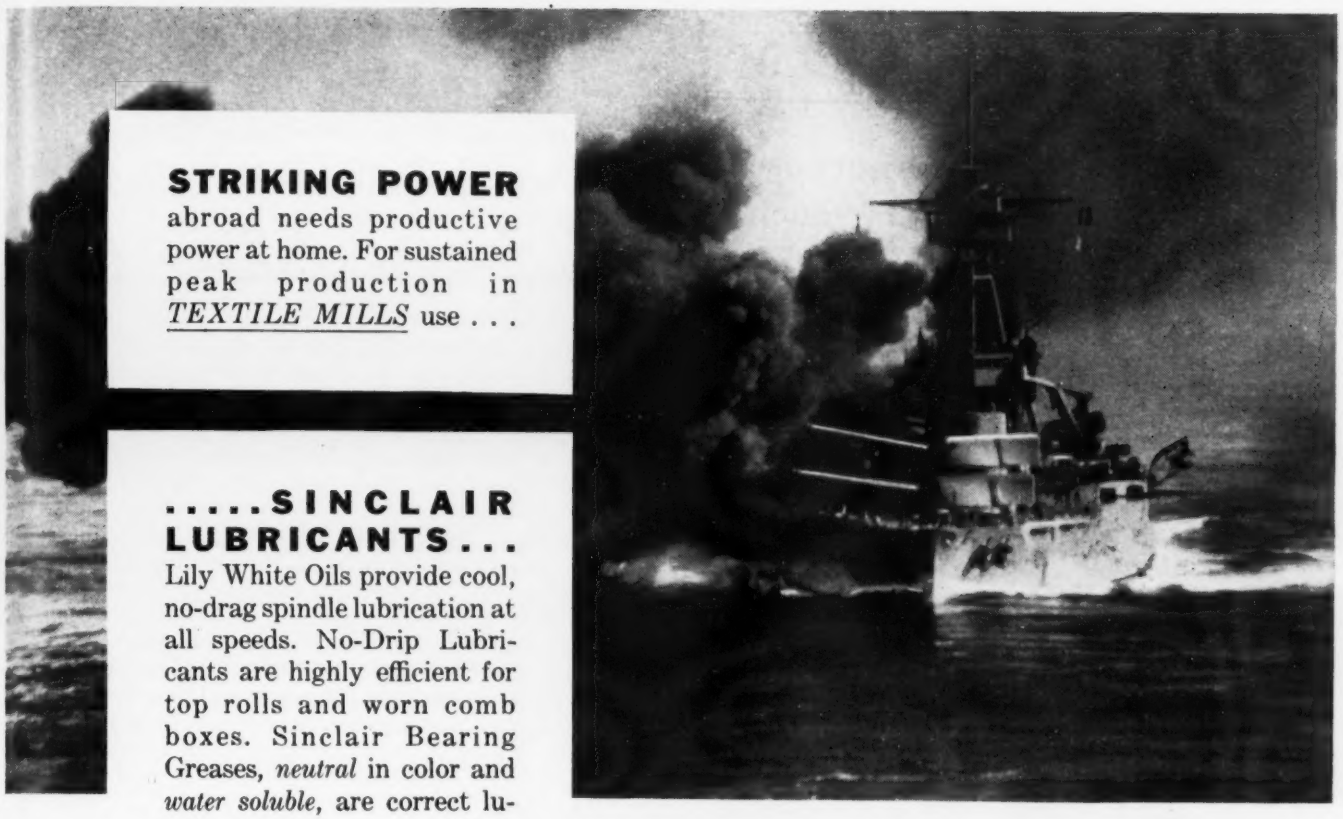
Many Chemicals Scarce

Acute shortage of some types of dyes and chemicals and fairly ample supply of others have given rise to an anomalous situation. To meet the heavy demands by the military services for vat-dyed fabrics, it is estimated that approximately 22,433,000 lb. of anthraquinone vat dyes will be required in the next few months. This will severely tax the capacity of dye manufacturers. Supplies of other types of dyes are, in general, believed to be sufficient to fill civilian requirements. However, to conserve dyes, rayon dyers and printers are limiting black, navy, and six other dark shades to 25% of each dye order accepted from customers.

Aluminum chloride, aluminum sulphate, and other aluminum compounds are virtually unobtainable for processing civilian fabrics, due to WPB restrictions on manufacture of these chemicals for non-essential purposes. Supplies of technical gelatine for civilian uses are small, approximately 65% of total gelatine production being employed for military applications.

Most animal and vegetable oils are scarce, especially sulphonated oils; supplies of pine oil and mineral oil are considered adequate. Starch production is at a peak, but increased demands and cutting off of imports of tapioca



STRIKING POWER abroad needs productive power at home. For sustained peak production in *TEXTILE MILLS* use . . .

. . . . . SINCLAIR LUBRICANTS . . .

Lily White Oils provide cool, no-drag spindle lubrication at all speeds. No-Drip Lubricants are highly efficient for top rolls and worn comb boxes. Sinclair Bearing Greases, *neutral* in color and *water soluble*, are correct lubricants for pressure-fitted plain bearings. Sinclair brands include Knitting Machinery Oils.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.

SINCLAIR TEXTILE LUBRICANTS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE

SINCLAIR REFINING COMPANY (Inc.)

2540 West Cermak Road, Chicago • 10 West 51st Street, New York City • Rialto Bldg., Kansas City • 573 West Peachtree Street, Atlanta • Fair Building, Ft. Worth

What Is Humidity For?

For an unsuspected purpose in textiles. And a very much better job with the help of

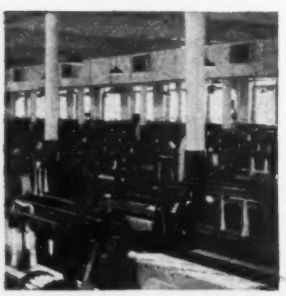
Certified Climate

Air enters through mixing chamber

Regain higher and more dependable. Greater strength and more uniformity in numbers.

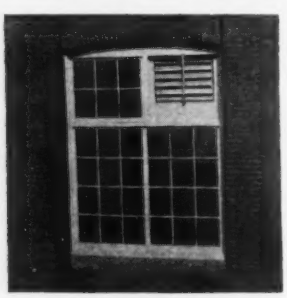
Propelled through ducts, graduated

Drafting of Fibers smoother and more compact. Waste and fly reduced to a remarkable degree.



Uniformity of many outlets

Fewer Ends Down. Not as many stops or piecings. Not as many adjustments. Cleaner and very much more comfortable rooms.



Automatic shutters let heat out

Better Product from shorter, less expensive staple. And very often 2% to 3% more production.

Certified CLIMATE with its exclusive method of control has been known to PAY FOR ITSELF in a year, or less.

Parks-Cramer Company

Fitchburg, Mass. Charlotte, N. C.

and rice starch have created a tight situation. Casein was placed under allocation last month.

There appear to be fairly adequate supplies of mineral acids, caustic soda, and soda ash. Heavy demand for hydrogen peroxide is keeping stocks at a low level.

▼ ▼ ▼

"We're On a Mighty Mission"

The above is the title of a booklet recently sent by Bibb Mfg. Co., Macon, Ga., to its customers. It contains reprints of many of the advertisements which the company has been running in the area from which it draws its supply of workers.

"We are now virtually 100% on war production," states Scott Russell, president, in the Foreword. "Our mills are running night and day to meet the requirements of our customers. We have actually stepped up production to 50% more than we believed was our full capacity. The Bibb is now the largest producer of war textiles in America. Even with this record we felt that we could still further increase our output and make better deliveries to our customers if we could reduce absenteeism and increase our supply of manpower." It was for the latter purpose that the company started running page advertisements in more than 100 newspapers. With the same idea, it is running page advertisements in its own paper, *The Bibb Recorder*.

▼ ▼ ▼

"The Burlington Mills Community Touch"

Burlington Mills Corp. has been using paid advertising space in the Greensboro, N. C., newspapers to feature "The Burlington Mills Community Touch." The copy reads: "When Burlington Mills comes into a community, it brings a clean, modernized mill, steady jobs, a substantial payroll, and a responsibility to you and the community. Many a dead or dying mill, many a previously run-down community, can attest to the value not only in terms of money but of renewed self-respect, of the life-giving 'Burlington Mills Community Touch.'"

▼ ▼ ▼

Recent WPB Activities

Among recent WPB utterances are the following:

Manufacturers of combed cotton yarn will be required to earmark portions of their production as orders are received from the military, but they do not need to anticipate such orders by setting aside certain percentages of their production in advance, as was previously required.

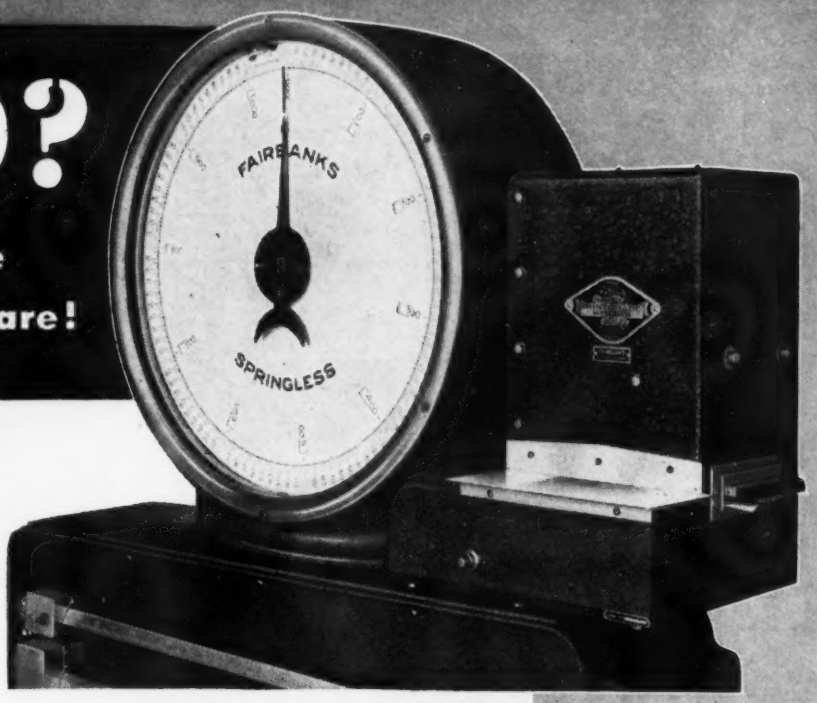
To reduce the variety and sizes of cotton, rayon, and wool blankets and at the same time assure production of utilitarian and well-wearing types, WPB has issued Order M-298. Blankets shall not exceed 84 in. in length, with the exception of white cotton sheet blankets, limited to a length of 95 in. The restriction applies to both single and double types. No line of blankets can be made in more than four colors, and white.

Producers of "unlisted" fine cotton goods for which specific maximum price has been requested are permitted to use the Jan. 6 maximums until May 24, while OPA makes a thorough examination of requested dollars-and-cents prices for these goods. The old ceiling prices were to have expired April 24, but a months' extension was granted under Amendment No. 4 to MPR No. 11—Fine Cotton Goods, effective April 23.

The entire production of dogwood is now confined to the

GOOD?

They have to be to get where they are!

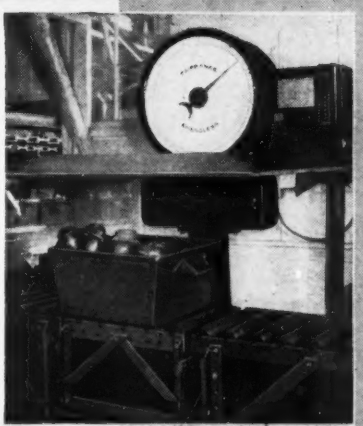


In good light or bad . . . operated by experienced weighmen or novices . . . weighing all kinds of commodities . . . Fairbanks Printomatic Scales have proved to the world that they have what it takes! They eliminate human errors, speed up weighing operations, and provide a PRINTED record showing what was weighed, who weighed it, and when.

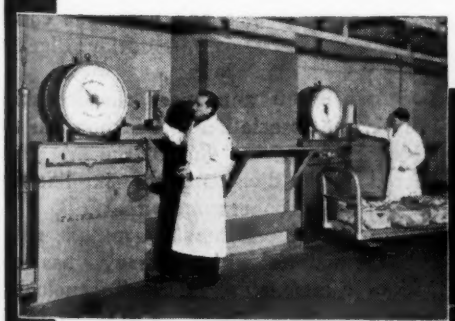
Fairbanks Scales have proved their reliability through their 113 years of service. Each part, carefully designed for its specific function and built with precision, guarantees your incoming, outgoing, and processing weight operations.

The Printomatic records the correct weight automatically, prints it on a roll tape, weigh ticket, or combination of both, or on gummed tickets. Adaptation of Fairbanks Printomatic Scales to weighing problems, simple or complicated, is practically unlimited. Why not investigate what these scales can do for you? Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill.

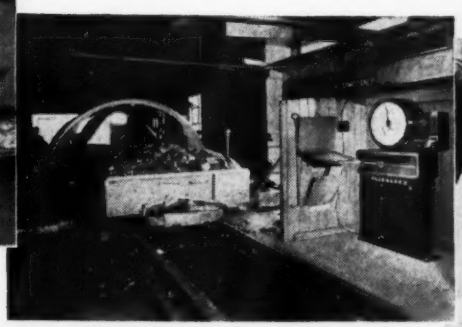
★



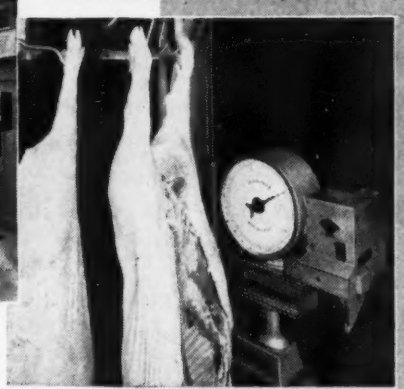
Fairbanks Printomatic Conveyor Scale keeps printed record of piecework in foundry.



Fairbanks Printomatics recording meat shipments to retailers. Each of 221 different kinds of meat is given a designating number.



Fairbanks Coal Mine Car Scale with Printomatic weighs mine cars in motion, protecting employer and miner.



Fairbanks Portable Dial Scale with Printomatic weighing and printing records of meat to retailers.

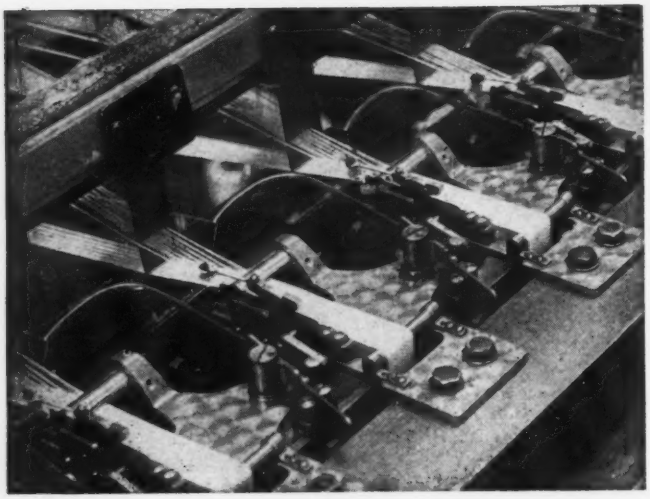
FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
SCALES

WATER SYSTEMS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
RAILROAD EQUIPMENT

FAIRBANKS SCALES

Scales



Change with the Times

CLUTSOM HIGHSPEED SHUTTLELESS LOOM

We are still planning for War but many executives are planning ahead for Peace too.

Vast production of narrow fabrics will be needed after the war and the trade will go to those mills best equipped. It is time to consider weaving in the modern way, time to discard the old. time to think in terms of speed and high production at lower cost. Time to change with the Times.

Why not let us give you a demonstration of weaving in the modern way—those old type looms must be wearing out under the wartime beating they are taking.

CLUTSOM MACHINES INC.

205 EAST 42 STREET NEW YORK

Telephone MUrray Hill 4-2327

FACTORY: Springdale, Connecticut

manufacture of shuttles and other textile machinery parts under Limitations Order L-285, effective April 13.

▼ ▼ ▼

Recent OPA Enactments

Among recent orders and amendments by OPA are the following:

OPA granted a rise of about 6% on ceiling prices on combed cotton yarn for military procurement on May 3.

Prices for airplane cloth have been adjusted upward by slightly less than 5% and dollars-and-cents ceilings for certain other military fabrics have been added to the fine cotton goods schedule by OPA (Amendment No. 3 to MPR No. 11).

OPA ordered that no reduction in prices received by manufacturers of industrial sheeting was required when WPB order altering sheeting constructions took effect on April 20.

A method for establishing manufacturers' prices for manipulated all-wool meltons for low-priced mackinaws based upon the cost of somewhat better raw materials needed to make these fabrics under wartime conditions is contained in Amendment 11 to MRP 163.

Underwear manufacturers have been permitted by OPA to continue their established maximum prices for fall and winter knitted underwear from which decorative rayon striping has been eliminated. (MPR 221 Amendment 3).

▼ ▼ ▼

This and That

Mohawk Carpet Mills is experimenting in production of a woven cotton fabric to be used as soles for shoes. The fabric is described as a flat-weave material woven on needle-type axminster carpet looms and processed chemically to give it stiffness and resistance to abrasion. Bigelow-Sanford Carpet Co. has a similar product.

Textile Fabrics Association announces the formation of a new group within the association to be known as the Water-Repellent Fabrics Division. One of the first problems to be considered by the division is the simplification of water-repellent fabrics in cooperation with WPB.

A new process for treating cotton with synthetic resins to produce a fabric-like material without weaving has been announced by Milton Simmons, of Texas Technological College. A modification of the process is said to produce a leather-like material.

Committee D-13 of the American Society for Testing Materials will hold its fall meeting at the Park Central Hotel, New York, Oct. 20 to 22, 1943.

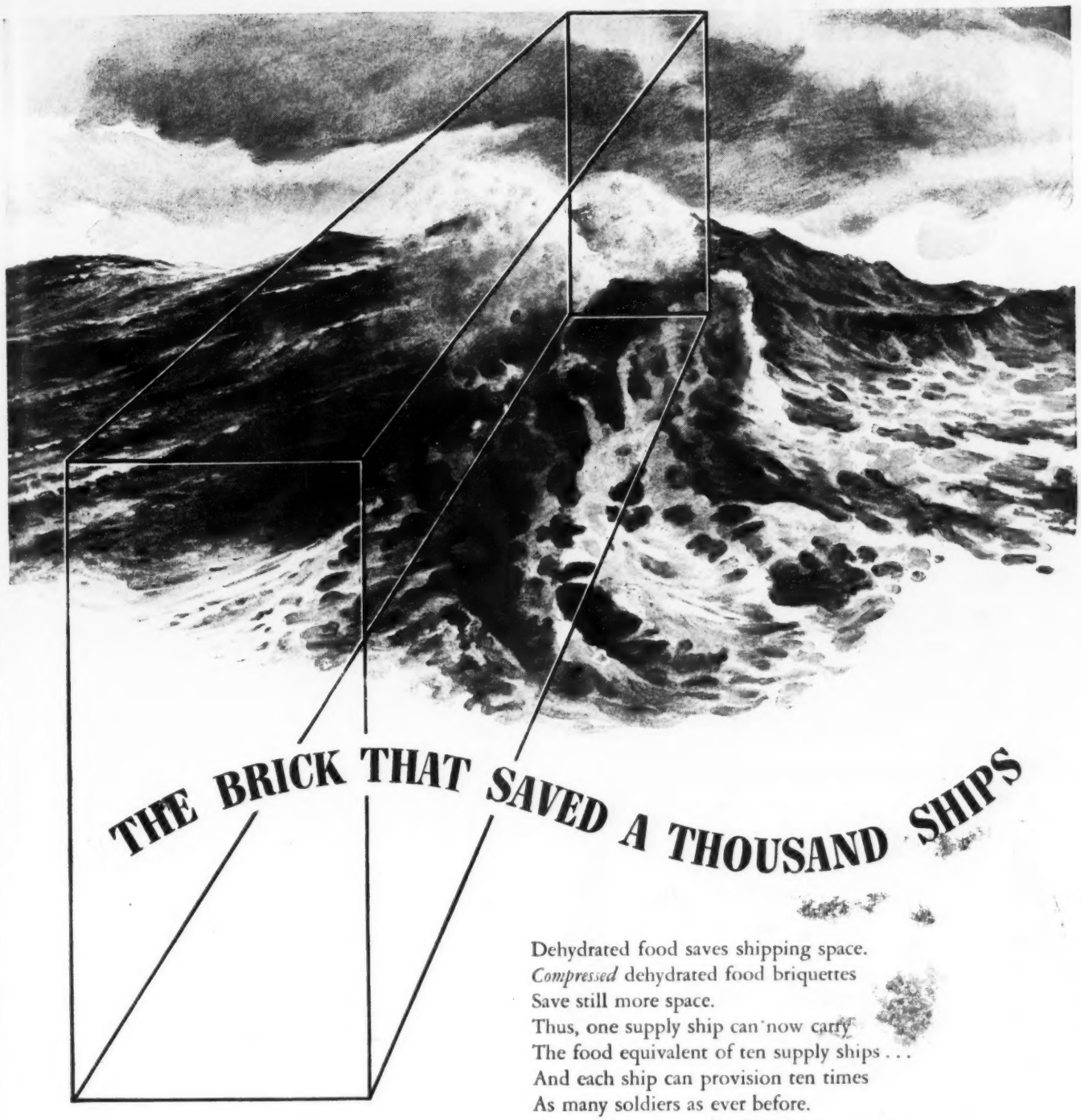
Rayon Export Corp., New York, has opened its own sales office in Mexico City at Isabella La Catolica 33. Office 114/115.

Annual "Cruise" of the Alumni Association of Philadelphia Textile Institute will be held at Manufacturers Country Club, Oreland, Pa., on June 4.

Lint-free acetate rayon fabrics have been developed recently by Celanese Corp. of America. These fabrics are being offered particularly for manufacture of garments for

TEXTILE CALENDAR

National Cotton Week, May 17 to 22, 1943.
Swim-for-Health Week, June 21 to 28, 1943.
Exposition of Chemical Industries, New York, Dec. 6 to 11, 1943.



THE BRICK THAT SAVED A THOUSAND SHIPS

Dehydrated food saves shipping space.
Compressed dehydrated food briquettes
Save still more space.
Thus, one supply ship can now carry
The food equivalent of ten supply ships . . .
And each ship can provision ten times
As many soldiers as ever before.
Air conditioning and refrigeration equipment
Makes possible these dehydrated food bricks . . .
Dependable and efficient cooling equipment
Provided by General Electric. After the war,
When air conditioning and refrigeration
Will again become available to the public,
Take advantage of G-E experience
In the fields of air conditioning and
Commercial and industrial refrigeration . . .
Turn to General Electric.
Air Conditioning and Commercial Refrigeration Department, Division 435, General Electric Co., Bloomfield, N. J.

Air Conditioning by **GENERAL ELECTRIC**

DARNELL
CASTERS & WHEELS

A SAVING AT EVERY TURN

For light, medium or heavy duty service Darnell Casters and Wheels are dependable—saving floors, equipment, money, time and temper.

FREE Manual FOR THE Asking

DARNELL CORP. LTD., 60 WALKER ST., NEW YORK, N.Y.
LONG BEACH, CALIFORNIA, 36 N. CLINTON, CHICAGO, ILL.

workers in war plants making delicate high-precision instruments. Other uses are wiping cloths for cleaning instrument parts, gloves, instrument covers, etc.

A rayon fellowship has been established by American Viscose Corp. at the Ellen H. Richards Institute, Pennsylvania State College. The objectives of the fellowship are, in general, to study the durability and proper methods of care of rayon fabrics from the consumer angle.

▼ ▼ ▼

Textile Trading Continues Routine

Cotton goods trading continued through April as in the recent past without much feature. Possibility of a ceiling on raw cotton brought a flurry. Manufacturers felt that the staple's price was already too high and that a ceiling on early April basis would also be too high without an upward revision of cloth ceilings. It seems now that the Government will sell from its stock at a price around 21¢ for $\frac{15}{16}$ in. and so discourage further gains. However, that level already makes it impossible for some mills to sell goods and get out whole. More herringbones are needed for Army use and conversion of twill and drill looms is suggested. Cotton yarns are tightly held.

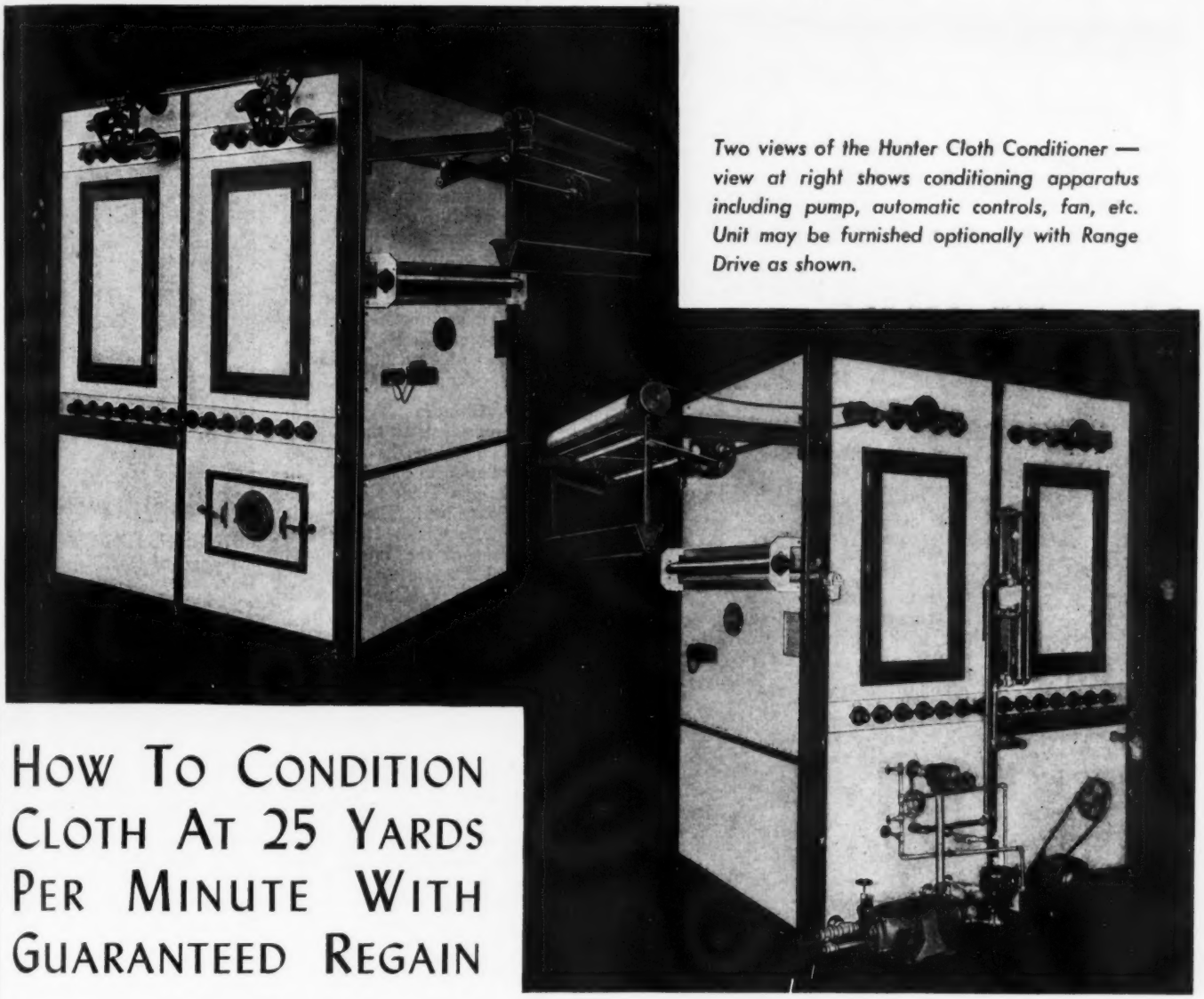
Wool goods are still being distributed on an allotment basis to the civilian trade by most mill agents, but there is constant assurance from many quarters that the total civilian supply available for next fall is adequate. Military needs will taper off somewhat as the year goes on, it is expected, and only the operations of Lend-Lease stand between the civilian and an almost normal supply. The CCC purchase of the wool clip is looked on by manufacturers with suspicion. However, they recognize that it should operate to stabilize raw wool prices although these are already too high. The blanket simplification order, M-298, is regarded as involving unnecessary difficulties in conversion by some mills and considerable confusion.

Rayon weavers recognize need for simplification in order that best use be made of the dwindling civilian supplies. It is estimated that rayon yarn supplies in the future may not exceed 50% of what was available for civilians last year. Reduction of basic weaves to 50 from over 200 is one step in the conservation program. A plan of civilian priorities is considered. Lining fabrics are notably scarce and that end of the field needs some bolstering. Rayon yarn producers are proceeding with conversion to h.t. yarns.

Hosiery mills are changing over as rapidly as possible to meet the requirements of MPR 339. There is still hope that through persuasion, Congressional pressure, or court action some of the unusual and oppressive features of that order may be changed, but most mill owners are taking no chances. Fine denier full-fashioned is the market's best-selling item. Hosiery simplification was greeted with favor and its details offered no particular problems.

Underwear mills are finding their cotton-yarn problem more and more acute. It was expected that WPB would soon take a hand in aiding the industry in this respect. OPA ceilings on fall underwear are regarded as oppressive and part of the trade is urging OPA to abandon the plan of uniform ceilings and schedule a basis which will take into account the advance in labor and raw material costs since March 1, 1942. Business in civilian goods continued thin.

Outerwear mills are progressing toward a simplification program which will conserve materials and manpower. Styles, weights, colors will all be cut, and unnecessary frills omitted. OPA has set up a "week-work" cost formula for women's and children's outerwear in Amendment No. 4 to MPR 287, effective April 12.



Two views of the Hunter Cloth Conditioner — view at right shows conditioning apparatus including pump, automatic controls, fan, etc. Unit may be furnished optionally with Range Drive as shown.

How To Condition Cloth At 25 Yards Per Minute With Guaranteed Regain

THE Hunter Cloth Conditioning Machine pictured on this page is the newest Hunter contribution to better finishing.

It is a machine affording a new principle of restoring natural moisture content to cloth after finishing. It is setting new records for evenness, uniformity, flexibility and production. It demonstrates that the addition of moisture content improves quality by evening shades, and provides a natural soft handle. It brings the cloth up to its proper weight and proper balance between moisture and fabric.

The unit includes an enclosure through which the cloth passes in vertical runs. It has an integral air conditioning unit supplying conditioned air to the enclosure for treating the cloth.

The Hunter Conditioner can be built with a capacity to fit any individual need, although the units pictured are large enough for 95% of the woolen and worsted mills.

The productive speeds are anywhere from 15 to 25 yards per minute, with a guaranteed regain of 10% on the bone dry basis.

The Hunter Conditioner is so constructed that there is absolutely no free moisture within the enclosure. Only saturated air is blown over both the back and face of the cloth. The conditioned air is automatically controlled, both as to temperature and humidity, by certified instruments. The Conditioner is provided with means for warming the inside of the enclosure before the Conditioner is started, thus eliminating any risk of condensation.

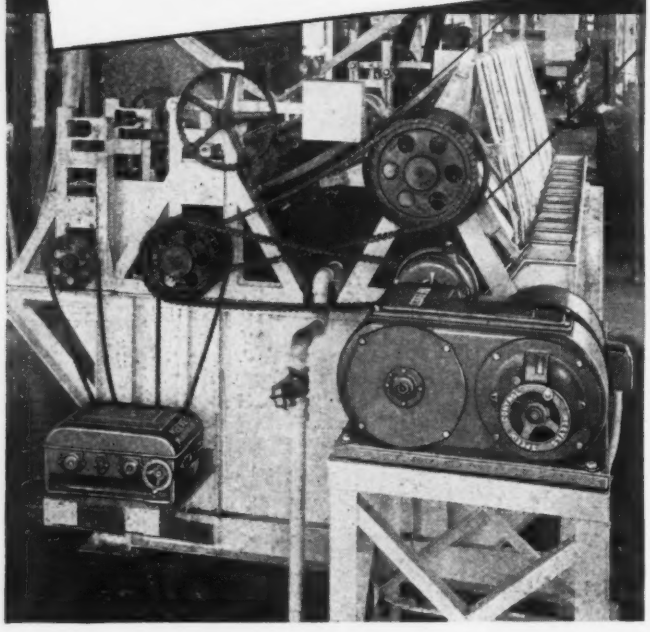
The Conditioner is not only a valuable adjunct for improving the finish, handle and shade, but also is invaluable in assisting mills to bring underweight fabrics up to required weights. These machines have proven themselves in operation on such a wide range of fabrics as worsteds, rayon and wool blends, blankets, O. D. Marine and Naval cloths.

FOR COMPLETE DETAILS, SIMPLY WRITE

JAMES HUNTER MACHINE CO.
NORTH ADAMS, MASSACHUSETTS
FOUNDED 1847

Reeves-driven Equipment

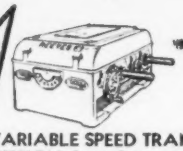
SPEEDS WASHING AND BLEACHING OF TOWELING



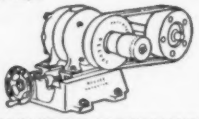
● Shown above is a 12-strand washer, one of the units of a towel bleaching range in a large bleachery. This washer is driven through a 10 h.p. REEVES Motodrive, and is also equipped with an enclosed-type REEVES Transmission to synchronize incoming squeeze rolls. From this washer, toweling is carried to other machines where it is dried, fluffed, cut into lengths, hemmed, sewed, etc. Other units in bleaching range, including 4- and 8-strand washers, saturators and "J-Box" units, are also REEVES-equipped to synchronize and control entire bleaching operation. REEVES Speed Control is standard on leading makes of textile machines, and is easily applied to machines in service. Write for Catalog-Manual WG-419.

REEVES PULLEY COMPANY
Columbus, Indiana

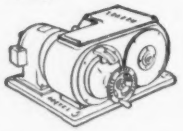
3 BASIC UNITS



VARIABLE SPEED TRANSMISSION for infinite speed control over wide range—2:1 through 16:1. Fractional to 87 h.p.



VARI-SPEED MOTOR PULLEY for application to shaft extension of any standard constant speed motor; 3:1 range. To 15 h.p.



MOTODRIVE—combines motor, variable speed drive and gear reducer. Speed range 2:1 through 6:1; to 10 h.p.

REEVES Speed Control

NEWS ABOUT MEN

Franklin W. Hobbs was reelected chairman of the board of the Textile Foundation at its annual meeting. **Frank D. Cheney** continues as treasurer and **Edward T. Pickard** as secretary and assistant-treasurer. Other directors are **Donald Comer, C. R. Wickard,** Secretary of Agriculture; **J. H. Jones,** Secretary of Commerce.

Dr. Claudius T. Murchison, president of the Cotton-Textile Institute, has accepted an invitation to membership in the Foreign Trade Reconstruction Committee. The group is headed by **Clark H. Minor,** president of the International General Electric Co., and **Dr. Alexander V. Dye** is executive director.

George A. Sloan, former president of the Cotton-Textile Institute, has been elected president of the New York Southern Society. **Magruder Dent,** of Joshua L. Baily & Co., has been elected vice-president.

Harold T. Lindsay, of Boston, has been elected president of the National Wool Trade Association. **C. Willard Bigelow** was reelected secretary-treasurer.

William L. Pitcher has been elected president of United Elastic Corp., Easthampton, Mass. He succeeds the late Judge Edward L. Shaw.

Julius G. Forstmann has been elected president of Julius Forstmann & Co., Passaic, N. J., succeeding his brother **Curt E. Forstmann,** who now becomes chairman of the board. **Julius Forstmann** was formerly vice-president and treasurer. The new treasurer is **Louis S. Decker** who has been with the company for over six years. **Curt E. Forstmann** remains as president of Forstmann Woolen Co.

John A. McPherson, chief engineer for J. E. Sirrine & Co., Greenville, S. C., textile and industrial engineers, has been appointed a dollar-a-year man with the Smaller War Plants Corp., and assumed his duties in Washington, D. C., April 12.

John H. C. Church was recently reelected chairman of the board of directors of Monument Mills, Inc., Pittsfield, Mass., while at the same time celebrating his 50th anniversary with this firm. The firm itself is within seven years of celebrating its 100th birthday.

LUTHER H. HODGES, general manager of Marshall Field & Co's. manufacturing division, with headquarters in New York and mills at Spray, N. C., and elsewhere, has been elected a vice-president of the company. He joined the company in 1919.

Charles W. Shepard, Jr., Gadsden, Ala., was promoted from vice-president of Atlantic Cotton Association to president at the convention in Charlotte, N. C., April 3. He succeeds **J. A. Baker** of Charlotte. **J. W. Davis,** Newnan, Ga., was made vice-president, and **J. M. Gloer, Jr.,** of Atlanta, Ga., was made vice-president and secretary.

Arthur D. Whiteside, president of Dun & Bradstreet, New York, has been appointed by **Donald Nelson** of WPB as vice-chairman in charge of civilian requirements. Mr. Whiteside will report direct to Mr. Nelson.

Kenneth S. Tanner, Spindale, and **Reid A. Maynard,** Burlington, have been named by Governor Mel Broughton of North Carolina as members of the textile committee of the board of trustees of University of North Carolina.

John F. McGlinn has succeeded **C. Hunter Biehl,** secretary and general manager of the Northmount Hosiery Corp., Reading, Pa. Mr. McGlinn has been office manager for the last 16 years.

Archie O. Joslin, for many years treasurer of Rock Hill Printing & Finishing Co., and a vice-president of M. Lowenstein & Sons, New York has been named executive vice-president of the latter firm. **David Gottlieb** for the last three years vice-president in charge of Lowenstein's general merchandising, has also been

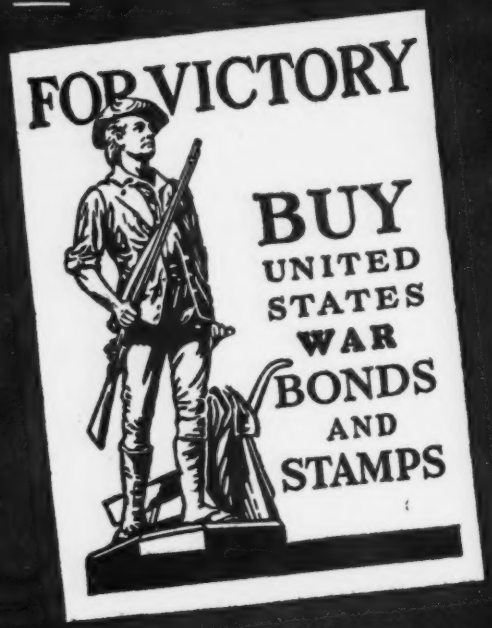
TEXTILE BANKING COMPANY

Factoring Service

Puts your sales on a cash basis
Strengthens your cash position
Relieves you of credit losses

55 MADISON AVENUE • NEW YORK

"Remember, Our Boys Give Their Lives . . .
You Lend Your Money!"



SOLVAY
TRADE MARK REG. U. S. PAT. OFF.

Suppliers of
LIQUID
CHLORINE

To the home front!
To the War Front!

SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by
The Solvay Process Company
40 RECTOR STREET NEW YORK, N. Y.

BRANCH SALES OFFICES:
Boston • Charlotte • Chicago • Cincinnati
Cleveland • Detroit • New Orleans • New York
Philadelphia • Pittsburgh • St. Louis • Syracuse

NEWS ABOUT MEN

appointed executive vice-president of that organization.

Delmar F. Reynolds has been appointed to head the Chicago office of Riverside & Dan River Cotton Mills, succeeding the late John C. Long.

Jere P. Quinlan, veteran hosiery selling agent, New York, has been elected temporary president of a social club for hosiery salesmen and selling agents, in New York, the organization of which was started by a meeting of some 45 representatives about the middle of last month.

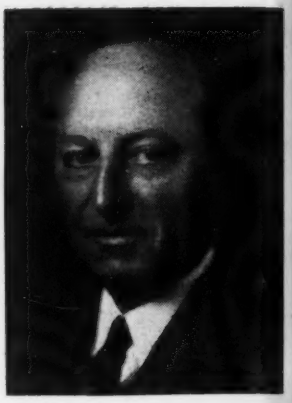
Walter E. Greer, Jr., secretary and assistant treasurer of the Judson Mills, Greenville, S. C., has been appointed as head of the synthetic fabric section of the Synthetic Textile Branch of W.P.B.

Miss Ethel Winston has joined the rayon department of Scheuer & Co., New York. Until recently she was associated with Iselin-Jefferson Co.

W. T. Wright, for the last 14 years office manager of Fairforest Finishing Co., Spartanburg, S. C., has resigned to join his father, **S. M. Wright** and brother, **F. D. Wright** as secretary and treasurer in the operation of the Mill Remnants Co., Charlotte, N. C.

Chester Eddy has relinquished his duties as manager of Augusta (Ga.) Chemical Co., to become plant manager of Narragansett Finishing Co., Westerly, R. I.

J. P. Schramm, who for 25 years was a director and production manager for the now closed Allen-A Co., Bennington, Vt., has become general superintendent of Super, Inc., Piqua, Ohio.



FREDERIC A. WILLIAMS, president and director of Cannon Mills, Inc., of New York, has become a member of the Advisory Board of the 320 Broadway office of the Chemical Bank & Trust Co. Mr. Williams is also vice-president of Cannon Mills Co., of Kannapolis, N. C.

Dr. J. J. Sussmuth, textile engineer and consultant specializing in rayon weaving, is now manager of the Velvet Textile Corp., West Haven, Conn.

Everett C. Atwell has been given charge of the special products division, research and development laboratory, Atlantic Rayon Corp., Lowell, Mass.

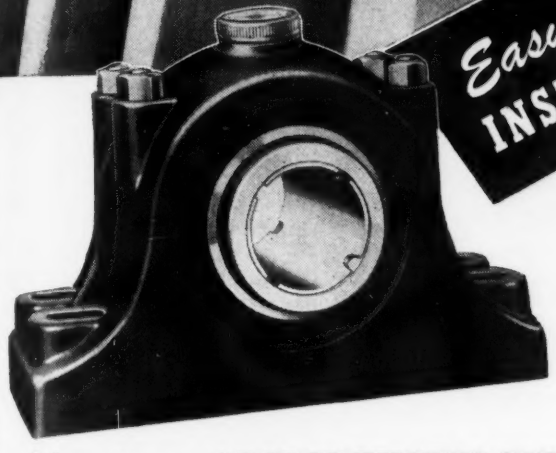
Karl M. Currier has been appointed manager of American Viscose Corp's., War Procurement Department, and **William M. Harvey** has been appointed assistant manager.

Joseph A. Truitt, head of the Woolen and Industrial Divisions of American Viscose Corp.'s Sales Development Department, has been transferred

SNAPPED AT ACMA MEETING in Atlanta: (left to right) William M. McLaurine, secretary-treasurer of Association; Hugh M. Comer, newly elected president; W. Harrison Hightower newly elected second vice-president. J. A. Chapman, elected first vice-president is not in the picture. See story page 94.

RUGGED DODGE-TIMKEN BEARINGS

get more *Battle Power* out of *Horsepower*

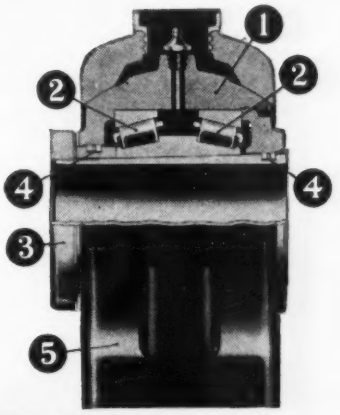


Super-rugged . . . Dodge-Timken bearings have what it takes to withstand the "beatings" bearings get in today's 168-hour weeks of war production. Completely assembled . . . ready for instant installation . . . capable of 30,000 hours of service . . . pre-lubricated for 50-million revolutions under normal conditions without relubrication . . . sealed against admission of dirt or leakage of lubricant. They eliminate maintenance delays . . . conserve vital man-hours and critical materials . . . speed peak production.

Advantages of DODGE-TIMKEN SPECIAL DUTY BEARINGS
1—Full ball and socket self-alignment . . . guards against power waste and wear. 2—Timken tapered roller bearings give full radial and thrust load capacity . . . put full power in production. 3—Easy to install—simply slip over shaft and tighten collar. 4—Piston ring seals retain lubricant and exclude dirt. 5—Rugged outer housing gives over-all protection to bearing.

Contact Local Dodge Distributor or write to

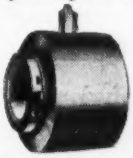
DODGE MANUFACTURING CORPORATION, Mishawaka, Ind., U.S.A.



Dodge-Timken Special Duty Ball-and-Socket Pillow Block

Dodge-Timken Special Duty "D" Unit Mount

Dodge-Timken Special Duty "S-1" Unit Mount

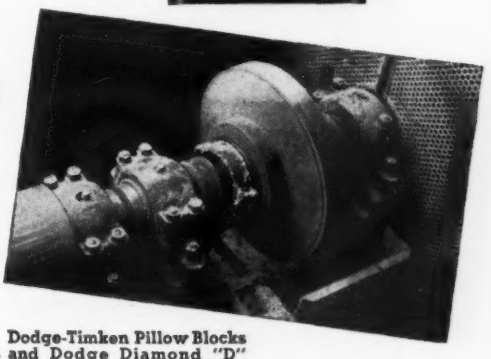


Dodge-Timken Special Duty "B-1" Unit Mount

DODGE
MISHAWAKA

THROW ALL YOUR SCRAP INTO THE FIGHT! . . . BUY MORE WAR BONDS!

THE RIGHT DRIVE FOR EVERY JOB

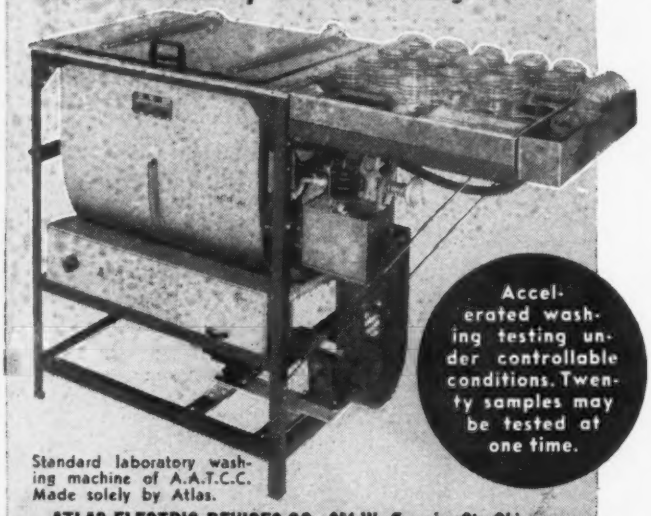


Dodge-Timken Pillow Blocks and Dodge Diamond "D" Clutch . . . dependable operation . . . low maintenance.

PUT *ALL* YOUR POWER IN THE JOB

LAUNDER-OMETER

for Washing Tests—Mechanical Action—Color Fastness and Staining Tests—Detergent Tests—Fastness to Fulling Tests—Leather Dyeing Tests—Dry Cleaning Tests—Vat and Sulphur Dye Tests—General Laboratory Use—Shrinking Tests.



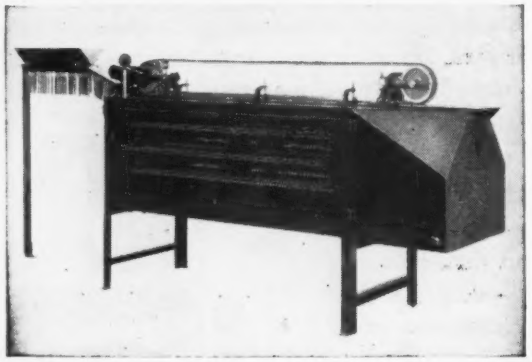
Accelerated washing testing under controllable conditions. Twenty samples may be tested at one time.

Standard laboratory washing machine of A.A.T.C.C. Made solely by Atlas.

ATLAS ELECTRIC DEVICES CO., 361 W. Superior St., Chicago

ATLAS-OMETERS

WEATHER-OMETER ★ LAUNDER-OMETER ★ FADE-OMETER



THE TYPE L

LOOM BOBBIN STRIPPER *for* *RAYON YARNS*

The Terrell Machine Co. *Inc.*

CHARLOTTE, N. C.

James F. Notman, Needham, Mass. . . . . N. E. States
E. W. S. Jasper, Inc., Elizabeth, N. J., Penn., N. Y. and N. J.
W. J. Westaway Co., Ltd., Hamilton & Montreal . Canada
Geo. Thomas & Co., Manchester, Eng. . European Agent

to the company's War Procurement Department, with headquarters in the company offices at Wilmington, Del.

Denzil V. Probasco has joined the Sales Development Department of American Viscose Corp. where he will serve as assistant to **Rene Bouvet,** superintendent of the Textile Unit, Marcus Hook, Pa. Mr. Probasco has been a member of the faculty of the Philadelphia Textile Institute and is on leave of absence for the duration.

H. C. Rothwell has been appointed textile specialist of WPB for Chattanooga, Tenn., area. His chief work will be in assisting textile industries in finding items needed in the war effort that they can make and advise with them in connection with changing their machinery to new lines of production.

Alfred R. Showalter has been named wool buyer for Bigelow-Sanford Carept Co., Inc., New York, succeeding the late Sorren Areson. He has been functioning as assistant wool buyer.

Leon Charles Lis has been made director of quality control for Aralac, Inc., Taftville, Conn. He was formerly technician for the Hartford Rayon Corp.

T. J. Smith is again associated with Riegel Textile Corp., Atlanta, Ga., and covers the southern territory. Several months ago Mr. Smith was drafted but was later given an honorable discharge.

Dean C. White, formerly senior administrative officer to the quartermaster at Camp Croft, S. C., has become personnel manager for Edwards Mfg. Co., Sanford, N. C.

S. M. Harrison, secretary of Echota Cotton Mills, Calhoun, Ga., and also a member of the board of directors, has been appointed general superintendent to succeed the late J. J. Nelson.

Richard Ralph has been made superintendent and assistant manager of E-Z Mills, Inc., Bennington, Vt. He has been associated with the local knitting mill for the last four years in charge of production and as assistant superintendent.

W. J. Cleveland, formerly overseer of carding at Judson Mills, Greenville, S. C., is now overseer of carding at Textiles, Inc., Priscilla plant, Gastonia, N. C.

H. C. Greenwood, superintendent of Grayson Hosiery Mill, Independence, Va., and **Thomas B. Sain,** superintendent of Salem (Va.) Hosiery Mill, have exchanged positions.

W. J. Harrison for the last three years chemist for Trion (Ga.) Co., has accepted a position as chemist and superintendent of Dodgeville (Mass.) Finishing Co.

L. M. Saxon has become assistant superintendent of Ingram Spinning Mills, Nashville, Tenn. He was formerly superintendent of National Textile Mills, Monrovia, Calif.

GOVERNOR ELLIS ARNALL (left), recently elected chief executive of the State of Georgia, spoke before the April meeting of the Atlanta Textile Club. William M. Babcock (right), of Talon, Inc., president of the club, presided. T. M. Forbes (center), executive vice-president of the Cotton Manufacturers Association of Georgia, was among the guests.

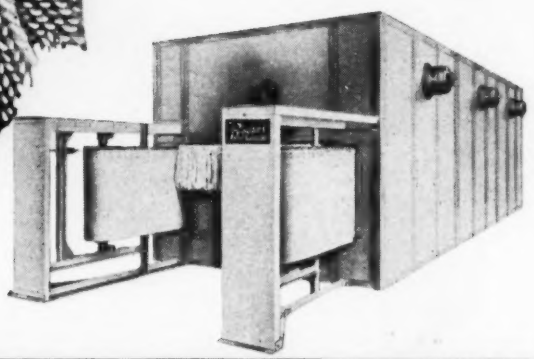
CHINES · PROCTOR DRYING MACHINES · PROCTOR DRYING MA

Recognition

PROCTOR DRYERS ARE RECOGNIZED BY LEADING MANUFACTURERS OF YARN

Just as she *recognizes* and appreciates, from experience, extra quality and texture in the yarn that goes into her knitting, so yarn manufacturers are quick to *recognize,* from their own experience, the extra quality that is built into Proctor Drying Machinery. To assure absolute drying uniformity, drying each weight of yarn to its proper texture, and keeping output to the highest possible level with a minimum cost, practically every yarn manufacturer in the country relies on Proctor Dryers. What is true in the yarn and textile field is true in nearly every major industry. Where there is a drying problem, there is a Proctor Dryer scientifically designed and "custom-built" to do the job *right.* If you have a drying problem, now is the time to have Proctor engineers consider its solution toward that day when other-than-war products can be purchased. Naturally, if your product is vital to the war effort, we can supply you with new machinery today.

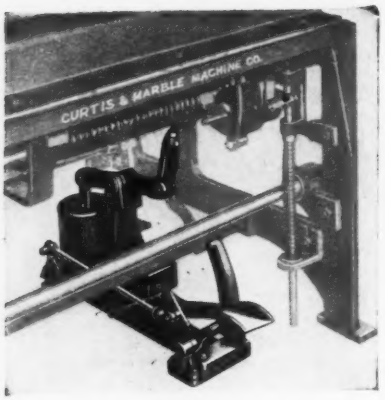
PROCTOR & SCHWARTZ • Inc • Philadelphia



PROCTOR AUTOMATIC SKEIN YARN DRYER with traveling skein protector. Used by skein dryers and converters for drying cotton, wool, silk and rayon yarn after dyeing, bleaching, etc. Wet skeins are hung on poles which are carried through the dryer by a continuous roller chain conveyor. The traveling skein protector, a flexible material hung skirt fashion from each of the two parallel runs of conveyor chain, is the unique Proctor feature which permits loading of poles to the very ends. Air circulation is straight down through skeins, drying them evenly all the way across.

CHINES · PROCTOR DRYING MACHINES · PROCTOR DRYING MA

LEWIS AIR LIFT



for use on

FOLDING MACHINES

WITH WOMEN increasingly replacing men as folding machine operators, textile mills and finishing plants are faced with the problem of making their mechanical equipment easier to operate, as well as keeping it at top-notch efficiency to meet the present challenge of production.

The Lewis Pneumatic Table-Lift eliminates the conventional foot treadle and the heavy work of raising the folding machine table by foot. This is especially hard on folders of larger than 4 or 5 inch capacity.

This Lift is operated by compressed air, usually available in mills and finishing plants—where not available a compressor can be supplied.

Ask Us More About It!

Curtis & Marble
MACHINE COMPANY
WORCESTER, MASSACHUSETTS

MEESE, INC.
Madison, Ind.

Textile Men in Armed Services

W. E. Fackert, Jr., St. Louis representative of Celanese Corp. of America for nearly four years, has been commissioned a first lieutenant in anti-aircraft artillery, and is assigned to duty at Galveston, Tex.

Arthur Meyer, formerly of J. P. Stevens & Co., New York, was recently commissioned a lieutenant, and is now stationed with the 53d Battalion, anti-tank, at Camp Wolters, Tex.

Joseph H. Burkhart, assistant public relations officer of the Chicago Quartermaster Depot, has been promoted from first lieutenant to captain.

Frederick Berlinger, president of Joseph Berlinger Co., New York, is now a lieutenant-colonel, having been promoted from major. He is with the Quartermaster Corps in Washington, D. C.

Anthony Napoli, who has been with the office staff of The Cotton-Textile Institute, New York, ever since it was organized, has been inducted into the Army. His associates gave him a dinner, and Dr. C. T. Murchison, president of the Institute, presented him with a wrist watch.

CAPT. WILLIAM G. ASHMORE, southern editor of TEXTILE WORLD until his call to active service in the Army, who is now in North Africa, after a period of duty in the British Isles.

CAPT. W. A. BEST, who recently became Officer in Charge of the Clothing Division, Bureau of Supplies & Accounts, at Navy headquarters in Washington, succeeding Capt. F. P. Delahanty.

Irving Russakow, president of Russbro, Inc., manufacturers of women's sportswear in Jamestown, N. Y., who went into the Army as a private two years ago is now a first lieutenant assigned to the Philadelphia Quartermaster Depot, where he is engaged on research work on WAAC and army nurses' clothing.

William R. Abrahamson, officer in charge of general supplies, Utah Quartermaster Depot at Ogden, has been promoted from captain to major.

Harry F. Clapham, on duty in the textile section, Research and Development Branch, Military Planning Division of the Office of the Quartermaster General, Washington, has been promoted from first lieutenant to captain.

Thomas R. O'Malley, in charge of patents for American Viscose Corp., has been commissioned as a lieutenant (j.g.) in Naval Reserve and has reported for duty at Jacksonville, Fla., where he is attending the Indoctrination School of the Naval Air Intelligence Bureau.

J. C. Self, Jr., son of the president of the Greenwood Cotton Mills and the Mathews Cotton Mill, both of Greenwood, S. C., and formerly prominently connected with the mills, has been promoted from first lieutenant to captain at

for the Safe Processing of All Fibers and Fabrics

Today, when safe, efficient processing is so vitally important, the soap you use in your wet finishing operations must really "deliver the goods." And in countless textile mills throughout the country Olate is doing just that.

In the interest of economical, efficient and safe production it will pay you to check the qualifications of Olate against those provided by the soaps or other processing agents you may now be using.

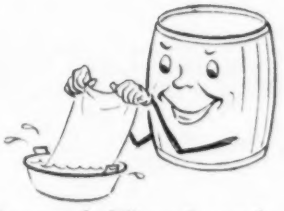
EXCEPTIONALLY LOW TITER

Rapid solubility is one of many Olate advantages. Saves time, labor, steam.

RAPID, THOROUGH RINSIBILITY

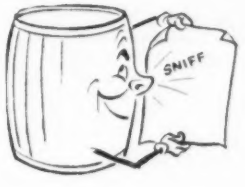
An important safety factor in processing any fiber or fabric. Olate rinses freely even at lower-than-average temperatures.

THOROUGH YET MILD CLEANSING ACTION



Olate's cleansing action is as gentle as it is thorough. There is probably no safer soap available than pure, neutral Olate — nor one with better detergent action.

STABILITY AGAINST RANCIDITY



Careful selection and refinement of the oils used in Olate — and exacting processing safeguards — make it unusually resistant to oxidation and rancidity. Coupled with Olate's free rinsing properties, this Olate advantage is an important safeguard against fabric discoloration or odor troubles.

Let this safe, efficient textile soap help smooth out *your* wartime processing difficulties.

Procter & Gamble

Olate *the universal textile soap*

INFRA-RED DRYING
Speeds Production

★ More and More textile manufacturers are installing the *new* CARBOMATIC RADIANT HEAT GENERATOR for drying and curing. They find that CARBOMATIC RADIANT HEAT GENERATORS . . .

- ★ Dry fabrics *quicker.*
- ★ Have easily adjusted, *automatically controlled* temperatures from 150° to 2200° F.
- ★ Greatly improve the *quality* of the finished product.
- ★ Are *more economical* than any other drying method . . . save labor costs and space.

Write for our new booklet T-9

INFRA-RED DIVISION

CARBOMATIC CORPORATION

ENGINEERS AND MFGRS. OF RADIANT HEAT BURNER EQUIPMENT

GENERAL MOTORS BUILDING, 1775 Broadway, New York, N. Y.

Also H. W. Butterworth & Sons Co., Philadelphia, Pa.
Offices in Providence, R. I., and Charlotte, N. C.

INDUSTRIAL ENGINEERS

Specializing in

TEXTILES FOR MORE THAN A QUARTER OF A CENTURY

RALPH E. LOPER CO.

COST SYSTEMS — WORK LOAD STUDIES
PAY ROLL CONTROLS
COST REDUCTION SURVEYS — SPECIAL REPORTS

GREENVILLE, S.C. — FALL RIVER, MASS.

FLAME-PROOFING
MILDEW-PROOFING
WATER-PROOFING

A 10 YEAR OLD PROVEN PROCESS — 'TREESDALE TREATED'

TREESDALE LABORATORIES, INC.

Exec. Offices: Benedum-Trees Bldg., Pittsburgh, Pa.
Research Laboratory & Plant, Mars, Pa.

his Army post on the Pacific Coast.

John L. Everett, former hosiery manufacturer in Franklin, N. H., before he was called into active service from the Naval Reserve with rank of lieutenant, is reported missing in action. The officer, a graduate of Annapolis in 1932, was in the submarine service in the South Pacific.

Raymond J. Carey, technician on the sales staff of General Dyestuff Corp., New York, an officer in the Army's Chemical Warfare Service, was promoted to the rank of captain in March. He is located at Dallas, Texas.

Walter B. Morehouse, manager of the Paper Specialties Division of National Oil Products Co., Harrison, N. J., has reported at Chicago for active duty as Lieutenant (j.g.) of American Volunteer Training, U. S. Naval Reserve. Now holding a private pilot's license, he will be given training as a flying instructor.

Frederick C. Wedler, of the War Procurement Department, American Viscose Corp., New York, has received a commission as first lieutenant in the Army and has reported for duty at the Ordnance Department, Philadelphia, Pa.

Marvin W. Blumberg, son of J. A. Blumberg, of Textile Mills Agency, Atlanta, Ga., and prior to entering the service associated with his father in business, now serving in the Army overseas, has been promoted to first lieutenant.

Warren R. Williams, Jr., son of Warren R. Williams, Sr., president of Sanford (N. C.) Cotton Mills, now serving in the Army at Fort Benning, Ga., has been promoted to lieutenant-colonel. He is 26 years old.

Ray G. Thomas, Jr., formerly cost accountant for Spindale (N. C.) Mills, who recently enlisted in the U. S. Merchant Marine, has been called to active duty.

R. Carter Henry, son of Robert E. Henry, of Greenville, S. C., president of the Dunean Mills and other mills, overseer in the preparation department of Victor-Monaghan Mills for a year prior to entering the Navy, now inspector at the Naval Clothing Dept., Brooklyn, N. Y., has been promoted to the rank of lieutenant (junior grade).

Joseph T. Klumpp, who before joining the Army was head of Joseph Klumpp Co., Philadelphia, has been assigned to duty at the Jeffersonville Quartermaster Depot. He bears the rank of lieutenant-colonel.

Obituary

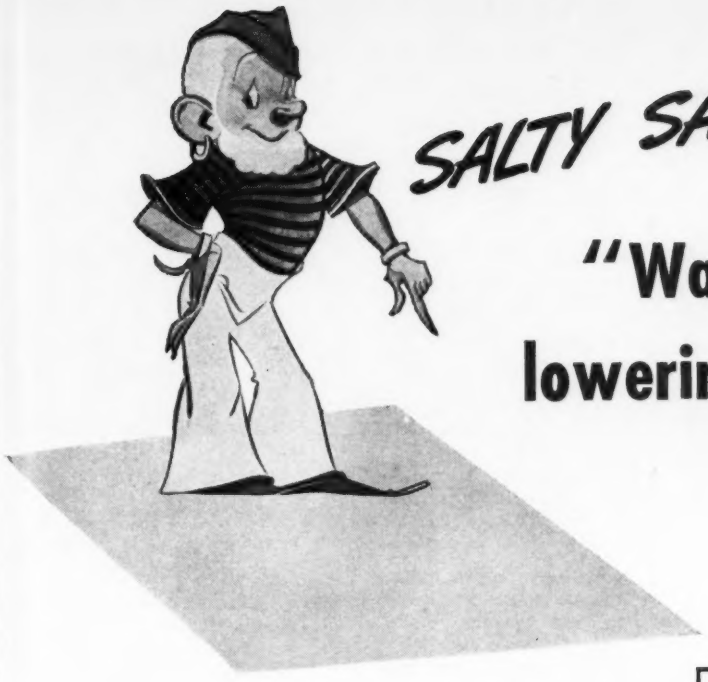
Asahel W. McLellan, 74, president since its founding in 1891 of the Alden Mills, New Orleans, La., died in that city April 25. Mr. McLellan was active not only in hosiery, the principal product of his company, but in cotton-textiles as his plant spins its own cotton yarn. He was president of ACMA in 1924. He has been member of the New Orleans Cotton Exchange since 1904, and travelled to South America in 1915 and to Europe in 1919 with groups to consult on foreign trade in American cotton.

ASAHEL W. McLELLAN

Henry McCusker, 83, president of East Braintree (Mass.) Finishing Co., died in Port Jefferson, N. Y., recently. He had founded the company 30 years ago and was continuously active in its management.

John Benton Pipkin, 87, president of Edna Mills Corp., Reidsville, N. C., and connected with these mills for more than 40 years, died April 18. He became associated with the mills in 1900 as secretary and treasurer.

Joseph Albert Gaither, 71, president of Ridgeview Hosiery Mill, Newton, N. C., and president of the Shuford National Bank until his resignation last year, died April 19.



SALTY SAYS:

"Want level dyeing while lowering production costs?"

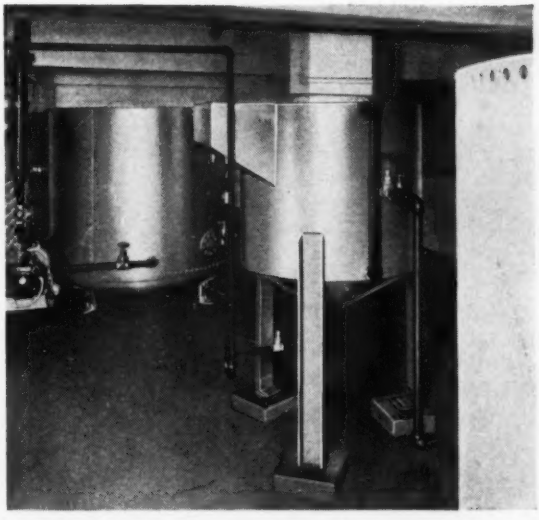
"IF YOU use a *100%* saturated brine for exhausting the dyes in place of *dry* salt . . . you can eliminate spotting, streaking and white edges!

"You see, brine disperses evenly throughout the vat . . . there's no chance of undissolved crystals ruining the dye lot when you use a *100%* saturated brine.

"And when you install a Lixator . . . you get 100% saturated brine every time! It's produced *automatically*. Furthermore, the Lixator cuts your production costs directly. First of all, it uses 10% to 20% *less* salt. Second, it utilizes inexpensive Sterling Rock Salt.

"But not only will the Lixator help you do a better job of dyeing. Lixate brine steps up the efficiency of zeolite water softener regeneration also.

"Can you think of a more valuable addition to your mill? And the beauty of it is—you don't need a heavy capital outlay in order to install a Lixator. International leases the machine to you for a very nominal annual sum. Get the facts, *today!*"



"This is the Lixator installed by Millbury Woolen Co. at their plant in Millbury, Mass."

"IT'S FREE!"

"Let me send you this 36-page fully-illustrated booklet on the Lixate Process for making brine. It gives you all the facts—installations, brine tables, diagrams, formulas. Just write for *your* copy!"

The LIXATE *Process*
Reg. U. S. Pat. Off.
for making brine

INTERNATIONAL SALT COMPANY, INC., DEPT. T5, SCRANTON, PENNSYLVANIA

The Bahnson Humiduct combined with the Westinghouse Precipitron gives positive lateral circulation of electrically cleaned air with controlled humidity.

The Bahnson Humiduct principle can supply conditioned air in any form—hot, cold, humid, dry, cleaned—or in any combination—automatically controlled.

Bahnson Engineers, experienced in textiles, are available for servicing post war planning—or priority installations.

Bahnson System
AIR CONDITIONING ENGINEERS
THE BAHNSON CO. WINSTON-SALEM, N. C.

FIDELITY 9-SKEIN REELER

Single- and Double-End Types. Collapsible arms on reel, automatic yardage control and improved tension device. Reduced doffing cycle with Twin-Unit System.

Write for Bulletin

FIDELITY MACHINE COMPANY
3908-18 FRANKFORD AVE., PHILADELPHIA, PA.

NEWS ABOUT MEN

Paul T. Cherington, 66, one-time secretary of the National Association of Wool Manufacturers, author, economist and consultant, died April 27. He served as professor of marketing at Harvard School of Business Administration, and was later director of research for J. Walter Thompson Advertising Agency at San Francisco.

Charles F. Thomas, 48, vice-president of Roberts Filter Mfg. Co., Darby, Pa., died late last month. He had been with the firm since 1910 with time out to serve in World War I. He had been sales manager for many years and was president of the Water Softener & Filter Institute.

Luther Pilling, 82, Danielson, Conn., president and manager of General Supply Co., manufacturers and jobbers of mill supplies, died April 13. He had been associated with the textile business from the age of 13. He had been with E. H. Jacobs Co., Danielson, and for 20 years was agent for Terrell Machine Co., Charlotte, N. C.

Frederick J. Orme, 62, vice-president and general manager of American Moistening Co., Providence, R. I., and associated with that organization for about 35 years, died at Providence April 26.

R. P. Deal, president of Deep River Mills, Randleman, N. C., for many years, is dead.

Edward R. Lawson, 73, formerly associated with his brother, the late Col. Walter Lawson, in Great Falls Bleachery & Dye Works in Somersworth, N. H., died recently.

James D. I. Husband, 64, marketing manager of Mohawk Carpet Mills, Amsterdam, N. Y., died April 17. He has been with the firm since 1926.

Charles Owen Dexter, 80, who had been one of the organizers of the Beacon Mfg. Co., and interested in other cotton mills, died at his home in Sandwich, Mass., last month.

Sorren R. Arneson, 47, for ten years wool buyer for the Bigelow-Sanford Carpet Co., New York, died at Scarsdale, N. Y., April 11.

Louis A. Wolin, formerly vice-president of Industrial Rayon Corp., Cleveland, died at Florida last month.

Willard F. Van Riper, 47, sales manager of the Organic Chemicals Department, Dyestuffs Division, E. I. du Pont de Nemours & Co., Wilmington, Del., died early last month. He had been with the Du Pont company since 1917.

PAUL T. CHERINGTON

H. Reeve Stockton, 63, of William Whitman & Co., New York, died April 17.

John C. Long, 55, Chicago representative of the Riverside & Dan River Cotton Mills, Danville, Va., died recently.

Arthur Goss, 65, head of the carding and spinning departments of Bradford-Durfee Textile School for 33 years, died in Fall River, Mass., last month.

Maxwell Ellis, 53, operator of Delaware Hosiery Mills, Seaford, Del., and head of Ellis Hosiery Co., Philadelphia, died recently.

Ernest T. Clary, 56, general superintendent of Whitin Machine Works, Whitinsville, Mass., died April 10. He was a graduate of Harvard and prominent in Worcester County affairs.

L. W. Pitman, 72, Scotland Neck, N. C., who established and operated the Crescent Hosiery Co. there, with branches in Wilson and Waynesville, N. C., died April 7.

James E. Monks, assistant treasurer of Shawmut Mills, Fall River, Mass., died April 4. Mr. Monks was also a director of the company.

Albert S. Ibach, 77, secretary of the Textile Machine Works, "Wyomissing," Reading, Pa., for many years died March 22.

Charles H. Pease, treasurer and general manager of Monadnock Blanket Mills, Marlboro, N. H., died recently in Orlando, Fla.

Clinton M. Powell, manager of Balston Yarn Mills, Inc., Lincolnton, N. C., died April 9. Prior to his connection with Balston Yarn Mills, he served for many years with the Charlotte office of H & B American Machine Co.

John T. Lineberger, 59, manager of Gastonia (N. C.) Belting Co., died recently.

For all cottons, CEGLIN* provides a permanent cellulose finish that greatly increases fabric strength and durability. It stabilizes shrinkage and stretching, increases resistance to slippage or distortion and to abrasion. CEGLIN* works unusually well with water-repelling and mildew-proofing agents. It is an excellent binder for pigment dyes.

CEGLIN* is fast, even to kier boiling. It may be applied before boil-off, before or after bleaching, during mercerization, before or after dyeing, or as a final finish. CEGLIN* is available in either dry or solution form.

*TRADE MARK REG. U.S. PAT. OFF. Product and processes patented.

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Pigment Colors for Use with Ceglin* Developed and Sold by
• ARIDYE CORPORATION, FAIRLAWN, NEW JERSEY

RYERSON CERTIFIED STEELS

Prompt Shipment from 10 Strategically-Located Steel-Service Plants... Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structurals, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes and Fittings, Mechanical Tubing, Rivets, Bolts, Nuts, Washers, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Detroit, Buffalo, Cincinnati, Cleveland, Boston, Philadelphia, Jersey City.

STAINPRUF

The

FUNGISTATIC—BACTERIOSTATIC WATER REPELLENTS

(On approved Army lists)

A significant new development offering a single bath treatment, water or solvent soluble, for *mildewproofing and water repellency*. Meet all applicable Government specifications. Non toxic under intended conditions of use, may be applied to wide variety of fabrics. Very attractively priced. Inquiries invited from Army Contractors.

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Phone 4-2500 Chatham, New Jersey

CARMAN & CO., INC., 629 W. 27 ST., N. Y. C.

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REPELLENTS • SOFTENERS
FINISHES

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BURKART-SCHIER CHEMICAL CO.
CHATTANOOGA, TENNESSEE

TEXTILE MILL NEWS

Cotton Mill News

Abbeville (S. C.) **Mills**—Directors of Deering, Milliken & Co., New York, operators of Abbeville Mills, have recommended to stockholders the sale of this plant. Transaction, it was estimated, would yield $13 a share to stockholders.

Cannon Mills Co. reports net profit after all charges of $4,560,544 for 1942 against $3,123,080 for 1941. Net sales for 1942 were $78,944,235 against $65,151,914 in 1941.

Fitchburg (Mass.) **Duck Mills** have passed into control of Edward H. Hall who becomes treasurer and general manager. Production of heavy duck will be stepped up, and a resin-impregnated canvas for shoe soles will be made. T. K. Ware continues as president.

Merrimack Mfg. Co. reports net profit after taxes of $477,792 for 1942 against $429,308 for 1941. Net sales were $15,950,351 for 1942 against $11,880,260 for 1941.

Desley Fabric Division of J. H. Thorp & Co., New York, has acquired the property and business of the U. S. Lace Curtain Mills, Kingston, N. Y. The business, now largely on war work, will be carried on as heretofore.

Mount Vernon-Woodberry Mills report net profit of $711,305 for 1942 against $836,889 for 1941.

Piedmont Bagging Co.'s new yarn plant at Anderson, S. C., has begun operations on a full-time day and night schedule, 100% on army orders. Construction of this plant began over a year ago, but war conditions delayed the delivery of certain machinery and electrical equipment. A. B. Rivers is owner and general manager.

Riverside & Dan River Cotton Mills, Danville, Va., has begun a seven-day work week for the first time in its history by operating Sunday. The decision was reached after the Government had asked for increased production on important war orders. All of the mill will not operate each Sunday.

Rock Hill (S. C.) **Yarn Mill, Inc.,** plans one-story addition to mill, estimated to cost about $50,000. Of this amount, $15,000 secured through local subscription is to be expended for building. The remainder, or $35,000, will be used for purchase of equipment, and will be provided by company, which is a subsidiary of Samarkand Rug Co., same place. R. A. Postlethwaite is president of yarn mill organization.

S. Slater & Sons, Inc., Slater, N. C., have completed construction of a new brick stack at power house, replacing a metal smoke-stack.

Springs Cotton Mills, Fort Mill, S. C., have begun construction of a 55-foot addition to local office of the mills. The addition will double the former size.

Wool Mill News

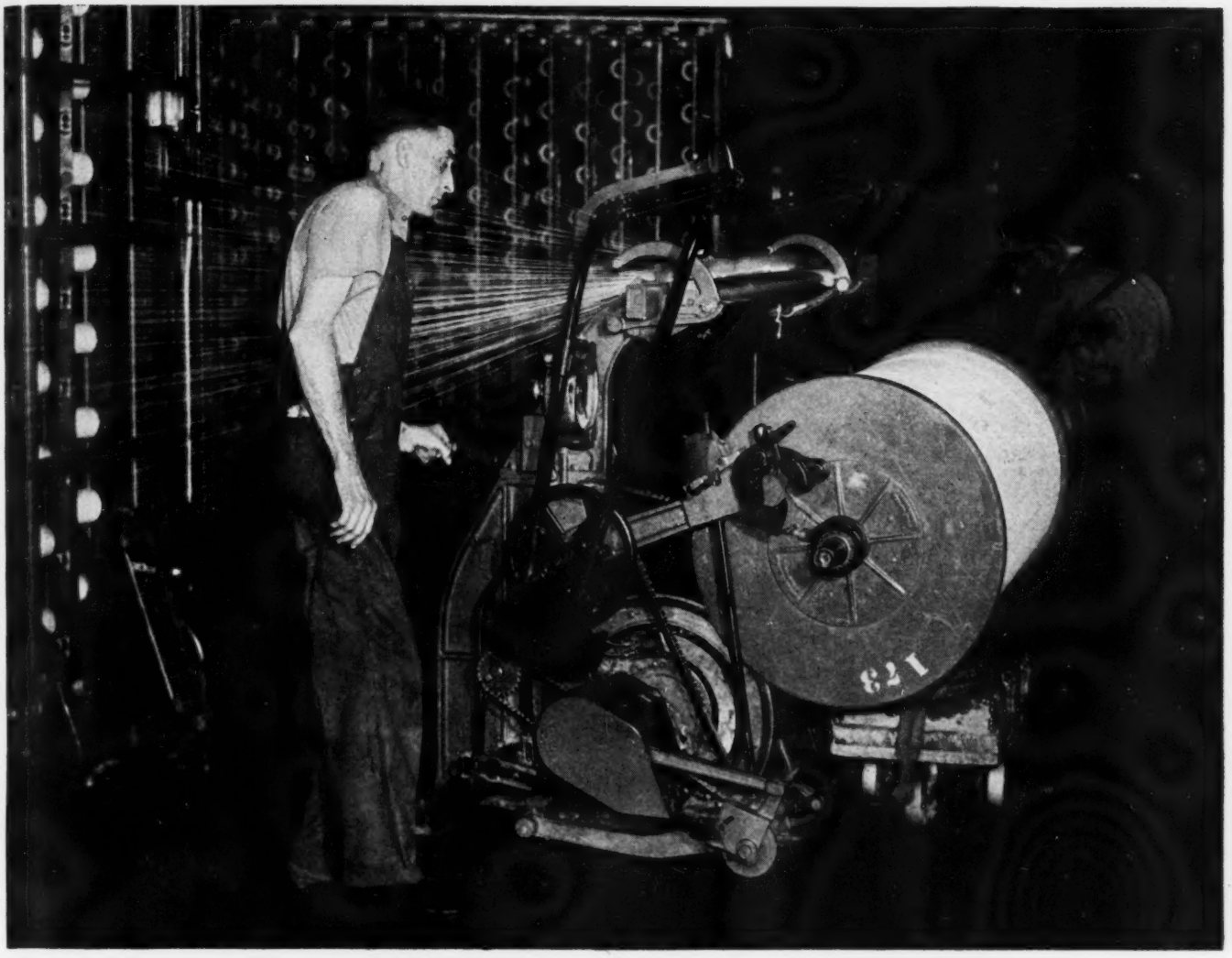
Altoona (Pa.) **Spinning Co.,** lately organized, has begun operation of a new mill in local building, secured under lease, and will specialize in production of cotton and woolen yarns. It is expected to give employment to about 75 operatives, with such working quota to be increased at later date.

American Woolen Co., Lawrence, Mass., plans conversion of power plants at Wood, Shawsheen and Ayer Mills from oil to coal fuel. Cost is reported close to $650,000, including machinery and coal storage facilities.

Amana (Iowa) **Society** has begun erection of new two-story mill addition, approximately 60x125 ft., to cost close to $60,000, with equipment. It is scheduled to be ready for service in about 30 days.

Botany Worsted Mills, Passaic, N. J.—Annual report reveals a net income of $506,834 after all charges, taxes, and reserves. Earnings have been added to surplus. This compares with a net income for 1941 of $1,456,579 after all charges, taxes, and reserves. Profits from operations for 1942 before Federal income taxes of $4,431,500. Social Security Taxes of $314,756, and depreciation of $317,943 were $6,821,034. Net shipments for 1942 were $38,740,992 an increase of 17.9% over shipments of $32,841,650 in 1941.

Continental Woolen Mills, Ltd., Toronto, Ont., recently organized as a subsidiary of Continental Rug Co., Ltd., 690 King St. West, plans early establishment and operation of



Makes Easy Work of Beam Loading

ONE of the many features of the Barber-Colman Super-Speed Warper is the beam loader shown in the above picture. With this handy unit, one man can easily and quickly load and unload even the heaviest beams. The loader consists of a hand-crank-operated double chain hoist, with hooks to drop over both ends of the beam shaft. For unloading a full beam, as the picture shows, turning the crank pays out the chains and the beam rolls down over the driving drum until it rests on the beam truck. For loading, the beam is hooked and then drawn up over the driving drum until the shaft is seated in its bearings. Thus the operation of the loader is extremely simple and requires very little effort. Changing of beams is accomplished rapidly, the average time for the complete unloading and loading operation being about three minutes. This is only one of many ways in which Barber-Colman Super-Speed Warpers help to increase production and reduce effort, thus doing their part toward making more war goods faster.

For Example . . .

The following data is from a mill running heavily on war goods.

Count	30s
Ends on Beam	420
Yardage on Beam	30,000
Net Weight of Full Beam,	475 lbs.
Beams per Warper per 24 hr. Day	22

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • TWISTER CREELS • MOISTURE CONTENT CONTROLS

BARBER-COLMAN COMPANY

ROCKFORD, ILLINOIS, U. S. A.

FRAMINGHAM, MASS., U. S. A. GREENVILLE, S. C., U. S. A. MANCHESTER, ENGLAND

ATTENTION!

That's what your fabrics will get from the purchaser when you use

DRUMMOND SOAP

Here's why . . . If you have to meet Army Quartermaster Department specifications your fabrics will show a big improvement right down the line if you use

DRUMMOND SOAP

It's a high-body product of low alkali content . . . No filler of any kind . . . A high binding quality that results in minimum flocking . . . Saves on steam and water because it rinses easily and completely . . . Better fulling and scouring . . . Leaves fabric perfectly clean with softest feel, better hand, brighter colors and whiter whites . . . Want to try it? Just write us today for a free working sample and test Drummond Soap on your own goods.

Standard Soap Co. of Camden

Protect the FUTURE of Your Business with WAR BONDS!

Charlotte, N. C. CATO M. LITTLETON 426 PARK TERRACE • 205 South 2nd St. Camden, N. J. • Woonsocket, R. I. G. TANGUAY 281 HARRIS AVE.

TEXTILE INDUSTRY RESEARCH

INCORPORATED

11 WEST 42ND STREET NEW YORK, N. Y.

CONSULTANTS ON TEXTILE MANUFACTURING AND DEVELOPING

SPECIALIZING IN

OPERATING METHODS. WORKING CONDITIONS. MAINTENANCE. WASTE CONTROL. NEW FIBRES AND PROCESSES

Essential Equipment in war or peace

The urgencies of war production emphasize the basic importance of an adequate testing routine to facilitate research, protect purchasing, speed production and safeguard quality. The 60 models of *Scott Testers are standard for the many textile testing needs.

SCOTT TESTERS

* *Registered Trademark*

HENRY L. SCOTT CO. 95 Blackstone St. Providence, R. I.

local mill for manufacture of blankets.

Northfield Mills, Inc., started work at the old Tilton Worsted Mills, April 1. The Tilton Mills, Inc., is now confining its work to the Laconia factory. General manager is Ruel E. Heywood.

Sequoia Mfg. Co., Boston, Mass., has been incorporated with capital of 1000 shares of stock, no par value, to operate a mill in vicinity of city for the manufacture of woolen and cotton goods. Harry Whittaker is president; and E. Howard Hutchinson, 29 East St., Hingham, Mass., treasurer.

Swift River Woolen Co. has begun rebuilding its three-story mill at Stafford, Conn., recently damaged by fire.

Tilton Worsted Mills, Inc., have discontinued the plant on Granite street in Northfield, N. H., but will continue operations at the plant on Union avenue in Laconia, N. H.

West Bend (Wis.) Woolen Mills Co., plans extensions and improvements in plant.

Wool-Ray Products Corp., New York—Charles Steinfeld sole owner of the outstanding stock of this company has caused all its assets to be transferred to him and the corporation will be liquidated. Mr. Steinfeld will continue to do business as heretofore under the name Steinfeld Fabrics Co.

Rayon and Silk Mill News

American Viscose Corp. in its report for the year ended Dec. 31, 1942, after reserving from net profit the amount of $1,156,000 in respect of the Federal excess profits tax post-war credit, shows profit of $5,590,032. The net profit of $6,746,032 before such reservation and after preferred dividends, compares with a net profit of $7,993,598 for the year 1941. Net sales of $90,319,086 for 1942 were the largest in the corporation's history and exceeded those of the previous year by 12.1%. Profit before income and excess-profits taxes was $20,603,032 as compared with $14,388,598 for the preceding year. The company has partially completed the conversion of one-half of the facilities of its Lewistown plant from the production of regular viscose rayon yarns to higher strength yarns for use in military equipment. Conversion of the company's Marcus Hook, Pa., plant to higher strength rayon was completed recently.

American Bemberg Corp. reports net profit after all charges of $243,982 for 1942 against $245,420 for 1941.

American Enka Corp. reports net profit after all charges of $1,885,262 for 1942 against $1,771,647 for 1941. Net sales for 1942 were 22% greater than 1941.

Atlantic Rayon Corp. reports net profit after charges of $250,449 for 1942 against $160,926 in 1941. Net sales and commissions totaled $11,862,362 for 1942 against $8,202,562 for 1941.

E. I. du Pont de Nemours & Co. has started the first full-scale unit for making tapered Nylon to replace Asiatic hog bristles in critically needed paint brushes in a New Jersey plant of the company's Plastics Department.

North American Rayon Corp. reports net profit after deductions of $1,431,741 for 1942 against $1,832,831 for 1941.

Stevens Textile Mfg. Co., Fall River, Mass., has been purchased by Cabot Mfg. Co. of Boston. Jacob Ziskind, president of Crescent Corp., Fall River, is also president of Cabot Mfg. Co. He bought the Cabot Mfg. Co., Brunswick, Me., last year and resold that property as a going concern. The Stevens property will be continued in operation. The Stevens name, however, has not been sold with the property, which includes 62 cards, 16,000 spindles and 300 wide jacquard looms.

Waumbec Mills, Inc., Manchester, N. H., has purchased the five-story and basement mill unit of Amoskeag Industries, Inc., it has been occupying in part under lease for some time past, as reported last month. Structure totals about 300,000 sq. ft. of floor space and part of this available area, in addition to present occupied space, will be used by purchasing company for expansion. Employment is now being given to approximately 400 workers, and it expected to increase this quota. A floor of the mill is tenanted by Hampshire Worsteds, Inc., under lease, which firm will continue in that place as heretofore.

Woonsocket Rayon Co., Woonsocket, R. I., has become the Woonsocket Rayon Division of Manville Jenckes Corp. It has been a subsidiary of the latter company for a number of years.

FULTON BAG & COTTON MILLS

Makers of Essential Cotton Products since 1870

COTTON·

The fibre of our Southland in fighting trim steps into the breach to replace metal cans, wooden barrels, boxes and burlap which are not obtainable except in very limited quantities. Cotton bags have proved their merit as successful containers . . . economical, efficient and readily available. Siftproof, greaseproof and waterproof, they are doing the job of protecting war and civilian goods in transit and in storage. In many instances they pay for themselves by the saving they effect in weight and in space. Cotton bags serve for flour and fertilizer, grain and gunpowder, cabbages and chemicals.

AMERICAN COTTON MADE IN U·S·A

FULTON BAG & COTTON MILLS

ATLANTA MINNEAPOLIS ST. LOUIS DALLAS NEW YORK NEW ORLEANS KANSAS CITY, KANS.

WHITMAN YARNS
WORSTED • COTTON • SPUN RAYON
ARLINGTON MILLS
LAWRENCE, MASS.
•
MONOMAC SPINNING CO.
LAWRENCE, MASS.
•
NONQUITT MILLS
NEW BEDFORD, MASS.
WILLIAM WHITMAN COMPANY, INC.
NEW YORK BOSTON PHILADELPHIA CHARLOTTE

Engineers
J. E. SIRRINE & COMPANY
GREENVILLE SOUTH CAROLINA

Simplified DESIGN
Flexible POWER
Better EVAPORATION
More sensitive CONTROL
SOUTHWORTH HUMIDIFIER
Experienced textile men who know the merits of previous models of Southworth Humidifiers have found improvements in Model D that make it even more reliable and efficient.
Extreme sensitivity of control, and an "airplane propeller" type fan for greater evaporation, are two outstanding features.
NOTE
This advertisement is to remind you to include Southworth Humidifiers in your after-the-war plans. Frankly, we are 100% on war work and cannot make humidifiers at the present time.
THE SOUTHWORTH MACHINE CO.
PORTLAND MAINE

Knitting Mill News

American Hosiery Co., New Britain, Conn., machinery and equipment was sold piecemeal April 14 to many buyers. Arthur Albert and M. M. Rothkopf, auctioneers, had previously bought it.

Crown Knitting Co., Inc., New York, N. Y., care of L. J. & G. A. Shapiro, 16 Court St., Brooklyn, N. Y., attorneys and representatives, recently organized with capital of $20,000, plans early operation of a local knitting mill.

Exeter Hosiery Mills, Inc., 25-12 41st Ave., Long Island City, N. Y., have taken over a one-story building on local site at 41-07 Crescent St., recently secured under lease, and will increase production at new location.

Gotham Hosiery Co.'s plant at southwest corner of 5th and Courtland streets, Philadelphia, has been sold to the Pep Boys for $117,725. The hosiery plant will be converted into a warehouse.

Hartford (Conn.) **Knitting Co., Inc.,** 983 Main St., recently chartered with capital of $50,000, plans operation of a mill in vicinity of city. Alexander R. Haas is president and treasurer.

Headen Hosiery Mill, Shelby, N. C., has begun operations in the local Eskridge Building, recently secured under lease, for processing and finishing of hosiery. Plant was formerly located at Hickory, N. C., and removed to new location a few weeks ago, where increased capacity is arranged. A. R. Headen is proprietor and manager.

Holeproof Hosiery Co., Marietta, Ga., has established a branch mill at South Pittsburg, Tenn., where industrial property has been secured as reported last month. About 100 knitting machines and accessory equipment will be installed. It is expected to begin operations at early date. Gordon Hill will be superintendent of new mill.

Mechanicville (N. Y.) **Knitting Co.** equipment was sold at auction recently. Cards and spinning equipment was sold to Troy Yarn Co. which will continue operation of it in part of the present building. Knitting and sewing machinery was sold to dealers and others.

Munsingwear, Inc., reports net profit after taxes of $400,483 for 1942 against $500,656 for 1941. Net sales in 1942 were $12,620,115 against $8,265,427 in 1941.

Pacolet Knitting Co., Lynn, N. C.—Mill of this company, idle for some time, has been taken over by Edward Foster, High Point, N. C., identified with a hosiery mill at that place. The new owner will modernize and improve.

Morgan Clan Knitting Mills, Inc., 717 Broadway, Newark, N. J., have purchased a two-story and basement industrial building on local site at 200-08 Badger Ave., approximating 20,000 sq. ft. of floor space. Property has been taken over and will be occupied for expansion.

Spalding Knitting Mills, South Pittsburg, Tenn., which was established two years ago with 15 looping machines and auxiliary equipment, has expanded to 34 loopers.

Trimfit Hosiery Mill, 16th St. and Hunting Park Ave., Philadelphia, Pa., has acquired a three-story industrial building, with two auxiliary smaller structures adjoining, at 191 West Roosevelt Blvd., and will occupy for expansion.

Processing Plant News

Joseph Bancroft & Sons Co. reports net profit after all deductions of $496,620 for 1942 compared with $1,752,599 for 1941. In the latter figure however is an item of $1,219,016 representing the sale of Eddystone Mfg. Co. Net sales were $15,514,230 for 1942 against $11,693,574 in 1941.

Columbus (Ohio) **Coated Fabrics Co.** sustained a fire loss at mill recently when cooling and drying department was damaged. An official estimate of loss has not been announced. The damage is being replaced.

Norman Finishing Co., Newburgh, N. Y., owned by Peter Fiory, has disposed of its machinery to the Van Vlaanderen Machine Co., Paterson, N. J., and it will be distributed at private sale.

Miscellaneous Mill News

Atlas Hemp Mills, Inc., Juneau, Wis., sustained a fire loss recently at mill, reported close to $7,500. The damage will be replaced.

A. & S. Atterman Co., 174 Boyd St., Newark, N. J., cotton waste, has acquired a four-story building at 21-23 Prospect St., Newark, and will use part of structure for expansion.

A DIFFERENT WAR? YES!

. . . and a different war presents new and difficult problems.

Uncle Sam's fighting men in the jungle, in the Arctic, on the desert - - all over the world - - are demanding fabrics finished to meet the extreme conditions of this *new* kind of war. ● Arkansas' vast peacetime experience is now solving wartime problems . . producing for textile processing and finishing plants products that meet exacting government specifications.

FRONT LINE PRODUCTS

FUNGICIDE G For mildewproofing all types of cotton cloth used in sleeping bags, webbing, tentage, mosquito netting, etc.

ARKO FIRE RETARDANT For flame-proofing uniform cloth, tentage, felts, etc.

CULOFIX L* For preventing color-bleed in water of direct dyed cotton.

AQUAROL* Produces a water-repellent finish on uniform cloth, overcoatings, and other military fabrics . . used in a single bath treatment with Fungicide G to impart water-repellency and mildew resistance . . used in a single bath treatment with Arko Fire Retardant to produce water-repellency and fire-resistance.

*REG. U.S. PAT. OFF.

ARKANSAS CO. INC.

NEWARK • NEW JERSEY

KEEP YOUR EYE ON THE BALL

The future is shaping up fast.

It takes no satin turban or fortune-teller's cards to see the coming events in tomorrow's crystal. They're with us already . . . more clearly defined with each new technological development, each new advance on the industrial front.

What these events will mean to you is equally plain. Radical departures in materials, methods, markets. Perhaps an entirely different approach to outgrown products, in order that they may meet post-war needs.

Wyandotte men . . . with a mind ahead of the job at hand . . . are ready to help you take up the challenge that peace will bring. Experience in furnishing basic chemicals to half a hundred industries has gained them a bird's-eye view of business trends, an all-over picture which fits the pieces together, points up those destined to affect your plans.

Would such *full*-vision be useful to you? Then our technical staff is at your command. Wyandotte, though working 'round the clock to supply Victory's urgent demands, is never too busy to be of service.

Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and The J. B. Ford Company to better serve the nation's war and post-war needs.

Wyandotte

OFFICES IN PRINCIPAL CITIES

WYANDOTTE CHEMICALS CORPORATION • MICHIGAN ALKALI DIVISION • WYANDOTTE, MICHIGAN

SODA ASH • CAUSTIC SODA • CHLORINE • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • DRY ICE

A Recent Installation of Four SARGENT STOCK DRYERS
in a Progressive New England Worsted Mill

A Production Problem Solved -

• • • THIS IS THE IMPORTANT FACT!

Advantages of this modern installation

— Stock dried at lower temperatures — The use of low pressure steam
— Lower power consumption — Less floor space required
— Costly repairs and breakdowns eliminated — A better product

Why not let SARGENT solve your Drying troubles ?

Important Defense Items by SARGENT	Machines for Smokeless Powder Plants • Machines for Synthetic Rubber Plants • Textile Machinery for the manufacture of uniforms • Machined parts for large caliber guns

C. G. SARGENT'S SONS CORPORATION

Graniteville, Massachusetts, U.S.A.

FOR PIGMENT PRINTING
and PIGMENT DYEING
in WATER SOLUTION..

SHO-PAL
THICKENER and BINDER

WASH FAST when the printed or dyed cloth is dried . . . eliminates curing.

DRY PRODUCT . . . easy to handle . . . saves shipping and storage space.

NO SOLVENT . . . does not damage rubber blankets.

ANY OTHER TYPES of COLOR can be used because the paste is made up with water.

WIDE PIGMENT CHOICE . . . you can select your pigment colors from several sources of supply.

NO STRATEGIC MATERIAL or homogenizing equipment required.

High Quality Results at Low Cost.

Prove these values for yourself.
Order a trial lot of Sho-Pal today.

STEIN, HALL MFG., CO. ★ STEIN, HALL & CO., INC. ★ STEIN, HALL, LTD.

2841 South Ashland Ave., Chicago 285 Madison Ave., New York City 250 Van Horne St., Toronto, Can.
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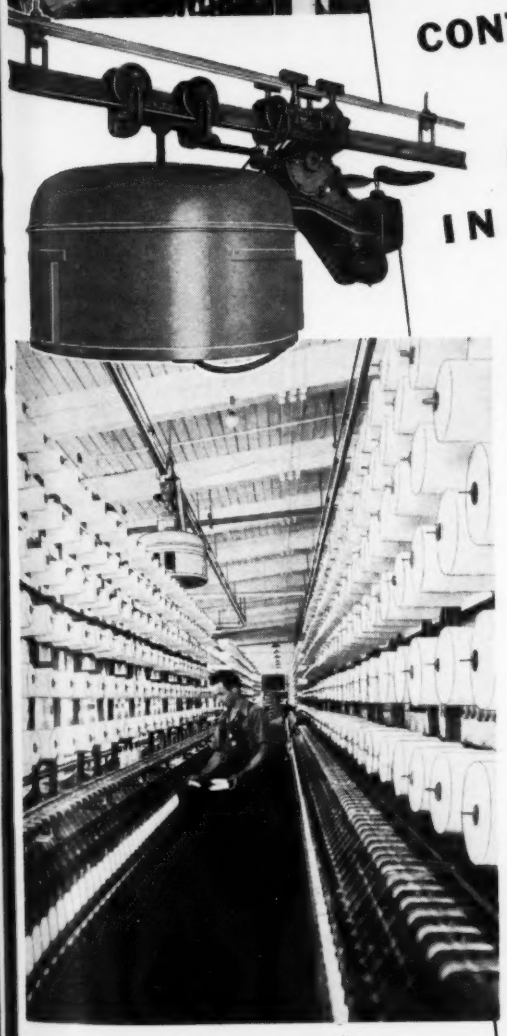
77 YEARS OF SERVICE SUPPLYING HIGH QUALITY STARCHES, GUMS AND DEXTRINES FOR SIZING, PRINTING AND FINISHING

Automatic cleaning over spinning

Cleaner over high speed twisters.



Preventing lint accumulation on high speed winders.

CONTROLLED CYCLONIC CLEANING

Cures the Headaches

IN LONG DRAFT SPINNING

★ The combination of American MonoRail MonoTractor, and a scientifically designed blower unit, solves the problem of lint accumulations on long draft spinning, high-speed twisting, winding and warping machinery.

Lint accumulation is eliminated with Overhead Automatic Cleaners. Automatic cleaning with swirling currents of air, carefully directed, removes lint before it can accumulate. Such cleaning keeps machines producing full time . . . enables operators to increase their output . . . and helps you to meet the war demands with MORE and CLEANER yarn.

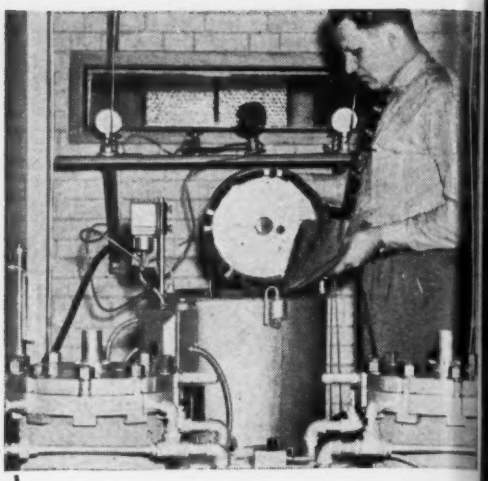
A competent engineer will gladly show you how to obtain better results in your mill. No obligation — write today!

THE AMERICAN MONORAIL CO.

13108 ATHENS AVENUE ★ CLEVELAND, OHIO

QM SPECIFICATIONS TO MEET?

THIS ARMOUR CHART HELPS YOU *quickly choose the specific soap you want for each wet finishing job . . .*



How long can the cloth in a soldier's uniform stand up under fighting in African dust storms or jungle swamps? The answer is found in this "Aging" machine test at the QM laboratory. (Photo, courtesy Photo Section, Philadelphia Quartermaster Depot.)

The Job	The Soap
Raw wool scouring	* CERTIFIED RE-NU
Woolen and worsted yarn scouring	* DOO ALL CERTIFIED RE-NU
Fulling Wool after-scouring. Cotton-rayon mix cloth boil off	* VERDANT TEXSCOUR CERTIFIED
Cotton yarn scouring	* VERDANT RE-NU CERTIFIED
Cotton and rayon cloth scouring. (Kier process) Scouring after vat dyeing Cotton and rayon knit goods scouring Absorbent cotton scouring	* FLINT INDUSTRIAL
Rayon and cotton hosiery boil off	* HILO RE-NU

Description of Soaps

(listed alphabetically)

Certified
Vegetable fatty acid base. Medium-low titer. In flakes and solid form.

Doo All
Vegetable fatty acid base. Medium titer. In polished flakes.

Flint
Tallow base. High titer. In chips and powder form.

Hilo
Vegetable fatty acid base. Medium titer. In powder form.

Industrial
Tallow base. High titer. In chips and powder form.

Re-Nu
Economical soap in jelly form.

Texscour
Red oil base. Low titer. In flakes.

Verdant
Olive characteristics. Medium-low titer. In flakes, powder (neutral or built) and bar.

Finishers Depend on Armour Quality

Whether your products must stand up under rigid QM tests or please critical civilian eyes . . . Armour soaps are your sure bet for every wet finishing job. Here's why: Only carefully selected raw materials go into Armour soaps, and every step in their manufacture is chemically controlled from Armour's laboratory.

Armour Soaps Quickly Available

Write, wire or phone Armour for the soaps you need. In many cases, delivery can be made the very day your order is received, because Armour has 321 Branch Warehouses located throughout the country. Get in touch with your nearest Armour Branch today.

** To fit your particular techniques and formulas, Armour offers a selection of soaps—with different types of bases, different titers and in various forms.*

ARMOUR AND COMPANY

Industrial Soap Division

1355 WEST 31st STREET • CHICAGO, ILLINOIS

321 ARMOUR BRANCH WAREHOUSES INSURE QUICK DELIVERY

BRANCH ARMOUR AND COMPANY

YOUR PLANT

PERKINS HOLYOKE
TRADE MARK REG

There is no substitute for Perkins Quality

B. F. PERKINS & SON, Inc.
HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

STALEY'S

Complete line of
UNMODIFIED *and* **MODIFIED TEXTILE STARCHES** ★

100% LABORATORY CONTROLLED
QUALITY ★ UNIFORMITY ★
DEPENDABILITY

STALEY'S *Complete line of*
UNMODIFIED *and* **MODIFIED TEXTILE STARCHES** ★

Today . . . **AS** *in* **WORLD WAR I**
SERVING *the* **TEXTILE INDUSTRY**

STALEY'S *Complete line of*
UNMODIFIED *and* **MODIFIED TEXTILE STARCHES** ★

A. E. STALEY MANUFACTURING COMPANY
DECATUR Staley's CORN AND SOY BEAN PRODUCTS **ILLINOIS**
ATLANTA, NEW YORK CITY, SPARTANBURG, CHICAGO, BOSTON

This simple test shows how the Concave Side

Cuts Belt *and* Power Costs!

Have someone bend a V-belt exactly as it bends in going around its pulley. As it bends, grip its sides with your fingers. You will *feel* those sides *change shape.* If the sides were straight before bending, they become *convex* as the belt bends. (See Figure 1 on the right.) Note how the sides *bulge out.*

Now try the same test with a belt which has the patented Concave side. You will feel the *same shape change*—but what a *different result!* The sides do not become *convex.* They become perfectly straight. The bent belt has a shape that exactly fits its sheave groove—as shown in Figure 2.

Two savings result. FIRST:—There is no side-bulge and this means uniform sidewall wear—*longer life!* SECOND:—There is a full side-width grip on the pulley and this carries heavier loads without slippage—saving the belts and also saving your *power!*

Only belts built by Gates are built with the Concave side, which is a Gates patent.

What Happens When a V-Belt Bends

FIG. 1

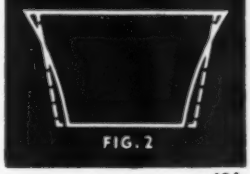


FIG. 2

434

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
DALLAS, TEXAS 2213 Griffin Street
NEW YORK CITY 215-219 Fourth Avenue
BIRMINGHAM, ALA. 801-2 Liberty National Life Building
DENVER, COLO. 999 South Broadway
CHARLOTTE, N. CAROLINA 507 Builders' Building
GREENVILLE, S. CAROLINA 104 West Washington Street
ATLANTA, GA. 738 C. & S. National Bank Building

New Modinal* DN for scouring and dyeing hosiery

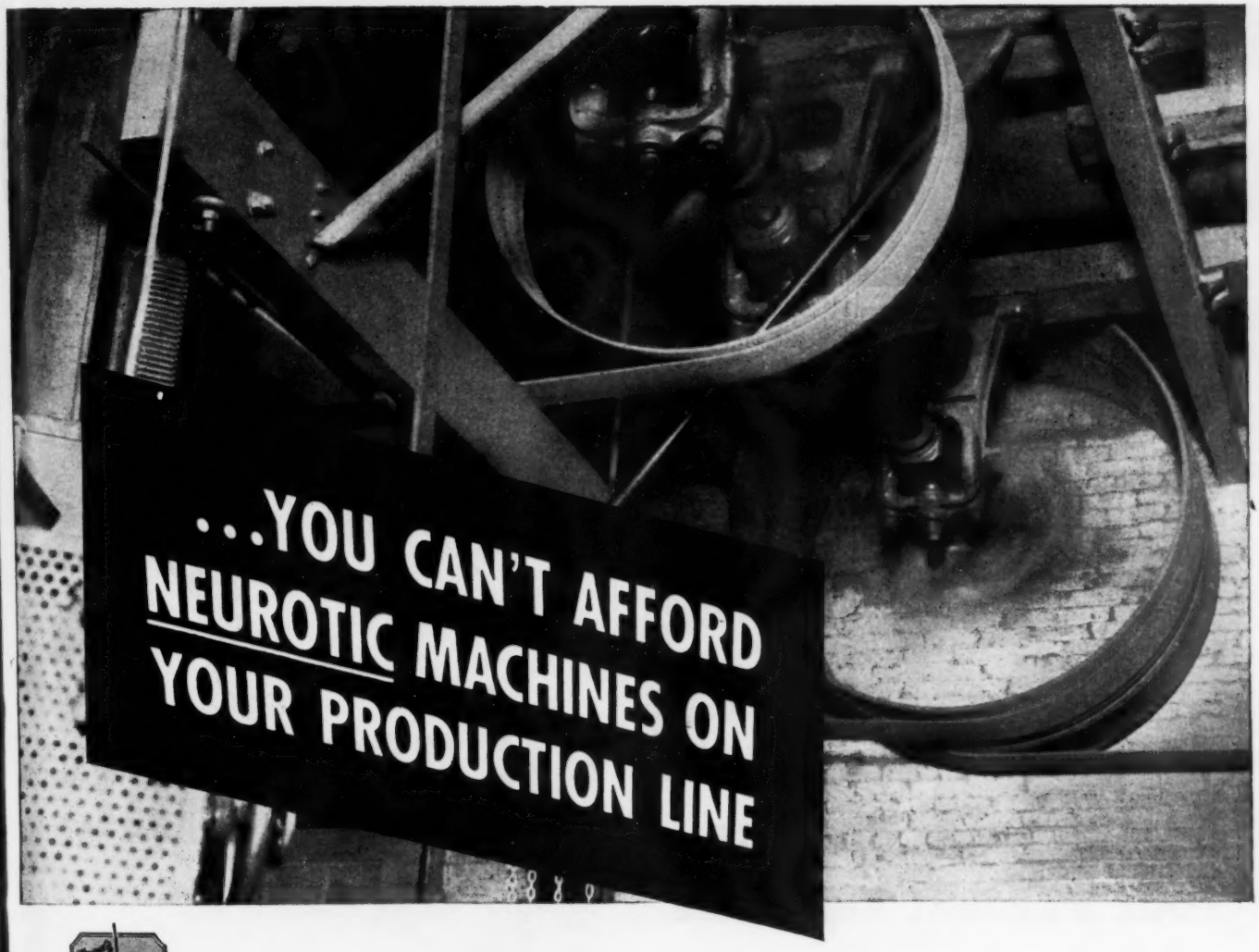
MODINAL DN is solving many of the current hosiery scouring and dyeing problems. This extra-strength detergent is a superior scouring and penetrating agent. It is effective for hosiery made of viscose rayon, acetate rayon, cuprammonium rayon, cotton or mixed fibers. Modinal DN gives you better-looking, better-selling hosiery, because it—

- ▶ **Effectively removes coning and knitting oils**
- ▶ **Improves penetration of dyestuffs**
- ▶ **Eliminates streakiness and blotches**
- ▶ **Produces more level, better matched dyeings on cotton tops and feet**
- ▶ **Prevents lime soap specks**
- ▶ **Saves on re-processing costs**

GET HELP from our experienced men on technical production problems. Gardinol Corp., Gen. Offices, Wilmington, Del. Sales Agents: Procter & Gamble, Cincinnati, O.—E. I du Pont de Nemours & Co. (Inc.), Wilmington, Del.

*MODINAL is the trade-mark used by the Gardinol Corporation to designate a group of its fatty alcohol sulfates.

MODINAL DN Fatty Alcohol Sulfates



Canny engineers tell us there's a certain "indescribable something" about WOOD'S group drives which seems to say, on sight: "Here's machinery that's rarin' to pitch in and do a real job." And just such service, these engineers find, is the outstanding characteristic of *all* WOOD'S equipment. Consult the nearest WOOD'S distributor for help with ailing or neurotic production. He can aid you in keeping vital drives clear of power leakage, waste and breakdowns.

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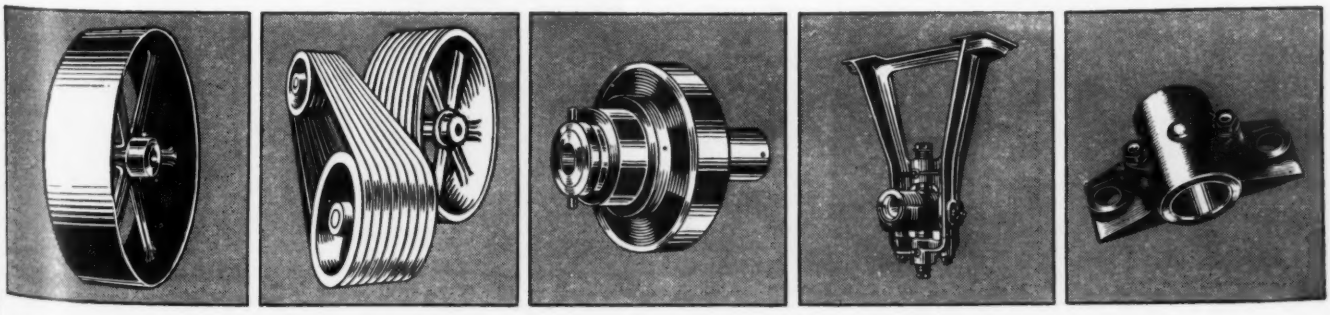

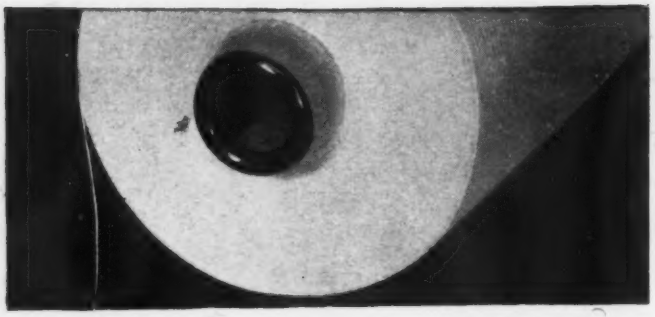

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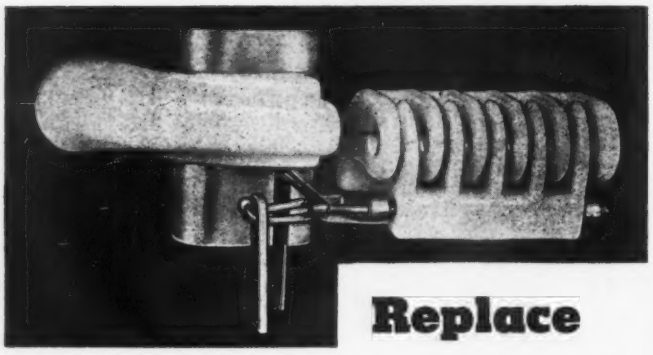
Patented



Replace Your Present Tensions

with the only balanced thread tension on the market. A guaranteed uniform tension is obtained regardless of the thread used or the speed employed. Over 20,000 already in use in woolen, rayon and cotton mills in all parts of the country. Send for trial order or write for full information.

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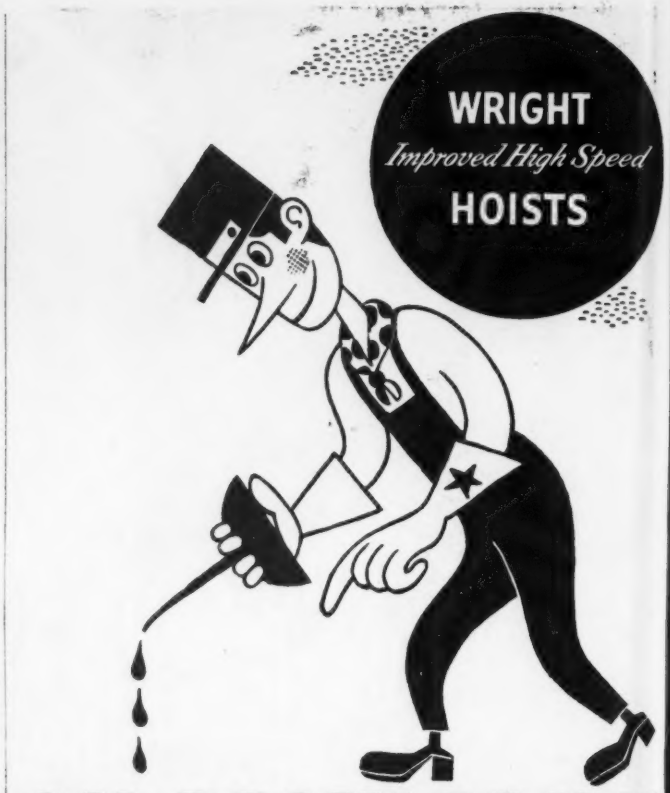
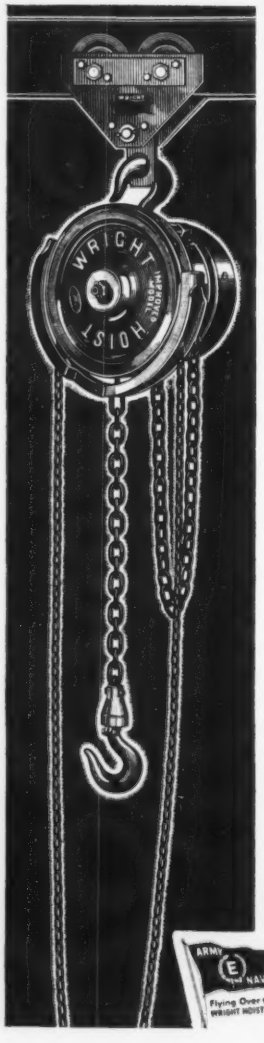


OIL REGULARLY!



In these days of shortages we don't need to know how to choose a new hoist—but how to use an old one more efficiently, and how to make it last longer.

So—get busy with the grease gun! Where properly lubricated and maintained, many **WRIGHT HOISTS** have given constant, trouble-free service for 20 and 25 years. We have known other hoists to be so badly abused they were ruined in two years. Your **WRIGHT HOIST** will last indefinitely if you treat it right.

If your hoist is under constant use, as on assembly line work, inspect and lubricate it at regular intervals. If it is subjected to intermittent service, then perhaps lubrication every three months and inspection every six months is sufficient. But keep your load chain well-lubricated at all times. A lubricated chain will far outlast a dry chain.

Conserve steel and maintain production schedules by regular inspection and lubrication.

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WETTING AGENT, PENETRANT and DETERGENT

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Apologies

We apologize to the many friends who, logically, have thought of Duplan as a source for their yarn requirements and found us very much preoccupied.

The demands upon our plants and organization for so many of the essentials of our war effort have made it impossible to take care of everybody.

We want you to know it has been difficult to say "No" even though you have realized why. We, of course, hope you will continue to try us on the throwing of all types of yarns.

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SILK • COTTON • WOOL
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FOR MILITARY OR INDUSTRIAL USE

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Rapid accurate wear tests with Taber Abraser can be applied to all types of weaves and knits from finest hosiery to heavy overcoating.

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Guard your quality reputation from complaints and rejections with Taber Abraser.

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Assist your spinning department to split their production target "dead-center" with superior Dary Travelers!

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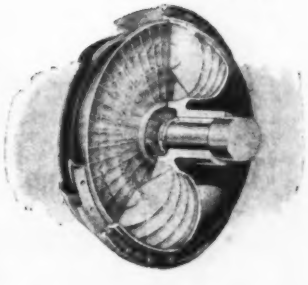
FLUID DRIVE A SUB?

LONG BEFORE you could buy an American built motor car equipped with Fluid Drive, American Blower Fluid Drives were approved and used in submarines by the U. S. Navy.

The Fluid Drive on a boat has many important advantages . . . It prevents transmission of torsional vibrations and shock from powerful Diesels to delicate machinery, synchronizes multiple engine speeds; permits rapid clutching and de-clutching and provides other equally important advantages.

Today, because Navy officials knew you could FLUID-DRIVE a sub, American Blower Fluid Drives are extensively used on many types of Navy craft. To American Blower's highly skilled engineering and manufacturing personnel have come many important assignments for Victory. And American Blower's extensive facilities for manufacture, fabrication, welding, processing, assembling, have been taxed to capacity.

After Victory, the skill, experience and proved manufacturing ability of American Blower will be available to promote the peace and prosperity of a free world.



Cutaway view of American Blower Fluid Drive. Note: there is no mechanical connection between driving and driven members.

ARMY E NAVY
For excellence in production.

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DAMP-TEX FOR
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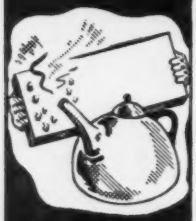
GIVES YOUR WALLS AND EQUIPMENT A PORCELAIN-LIKE FINISH OVERNIGHT

KILLS RUST* AND FUNGUS



Proved Steam-Proof by STEAM TEST

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Proved Resistant to 2% Caustic Solution by CAUSTIC TEST

Damp-Tex Enamel is used in 4,000 plants for wet surface maintenance. It penetrates and forces out moisture. Adheres to damp or dry wood, metal, concrete, plaster. Stops deterioration, rot, rust, bacterial and fungus growth*. Will not crack, peel, check, sag or fade. Comes in non-yellowing white and colors. One coat covers. Dries hard overnight into tough, porcelain-like waterproof film.

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Your first Damp-Tex is used entirely at our risk. *Send* for folder I for complete details.

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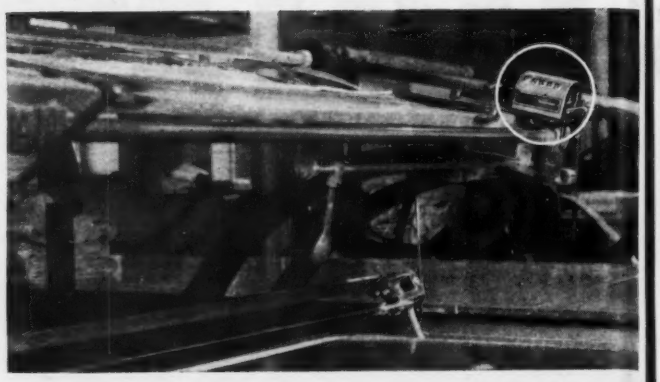

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With the vast textile industry unremittingly at work turning out materials for our armed forces, as well as for civilian needs, it is more than ever vital to have absolute check on production.

There's a Productimeter for every counting application throughout the entire processing . . . braiding, coating, combing, doubling, drying, folding, inspecting, winding, dyeing, bleaching . . . On looms the pick method of counting offers a sure way of determining rates of pay. And you can depend on Productimeters . . . they're built for speed, accuracy and hard service. (Above) Model 5-H-2 attached to Folding Machine.

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Why run even the risk of loose set screws and inevitable production troubles where self-locking "Unbrako" protection costs so little. It's the *knurled points* that make "UNBRAKO" Set Screws *self-locking*. With just ordinary tightening, the knurled points of every "UNBRAKO" dig in—instantly—and hold the screw permanently tight, regardless of vibration. YET—every "UNBRAKO" Set Screw can be backed out with little effort and re-used, again and again. Write us for catalog—today!

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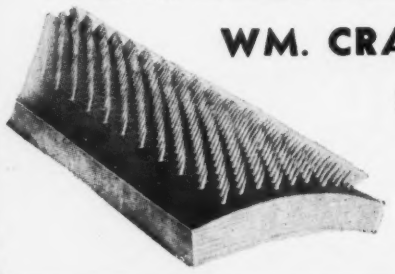
That's the whole story of the Crabb reorganization! Quality unsurpassed. Let us SHOW YOU how we can help on your war contract.



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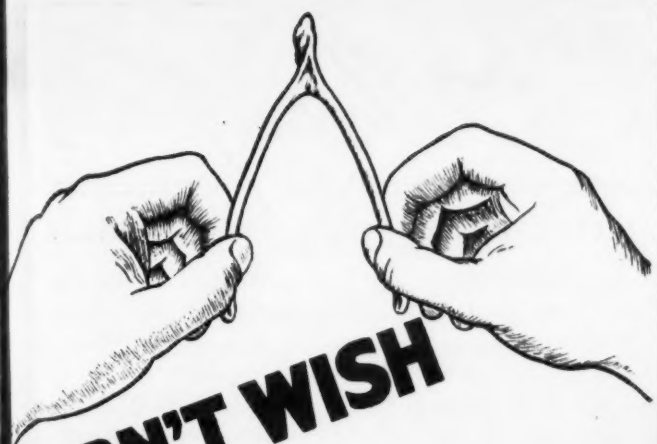

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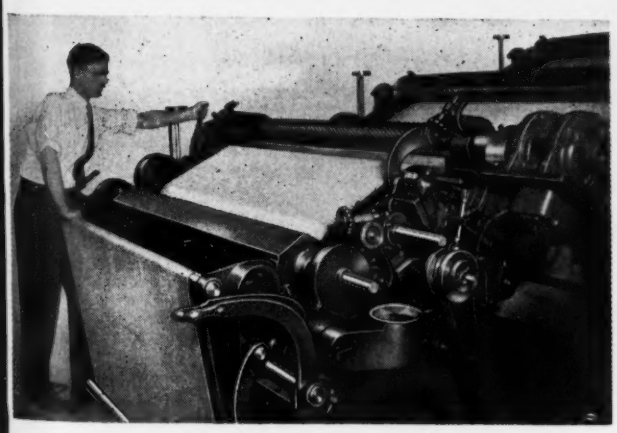

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No Blade Lifting

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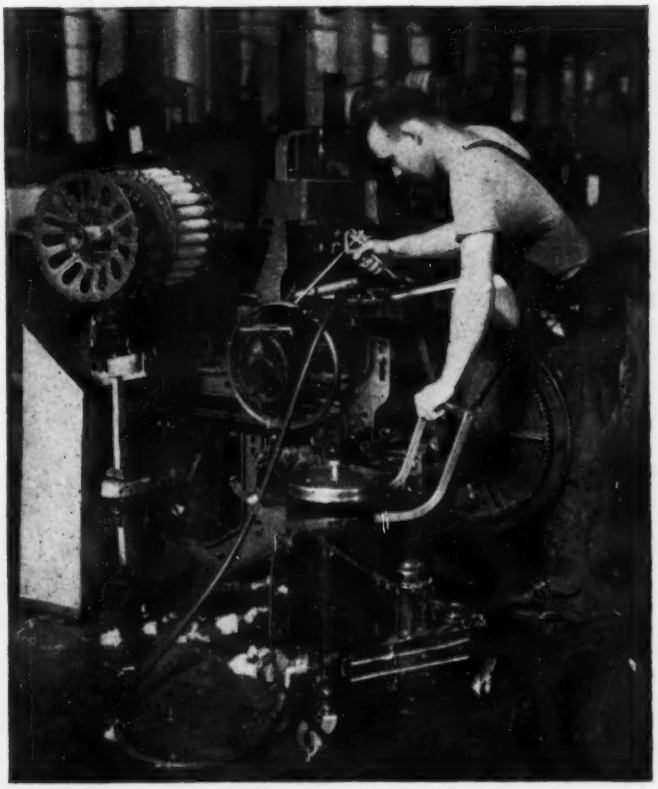

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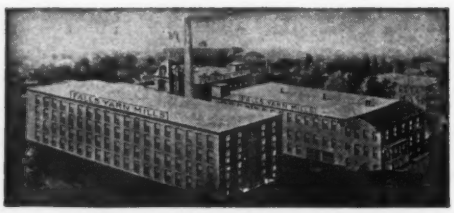

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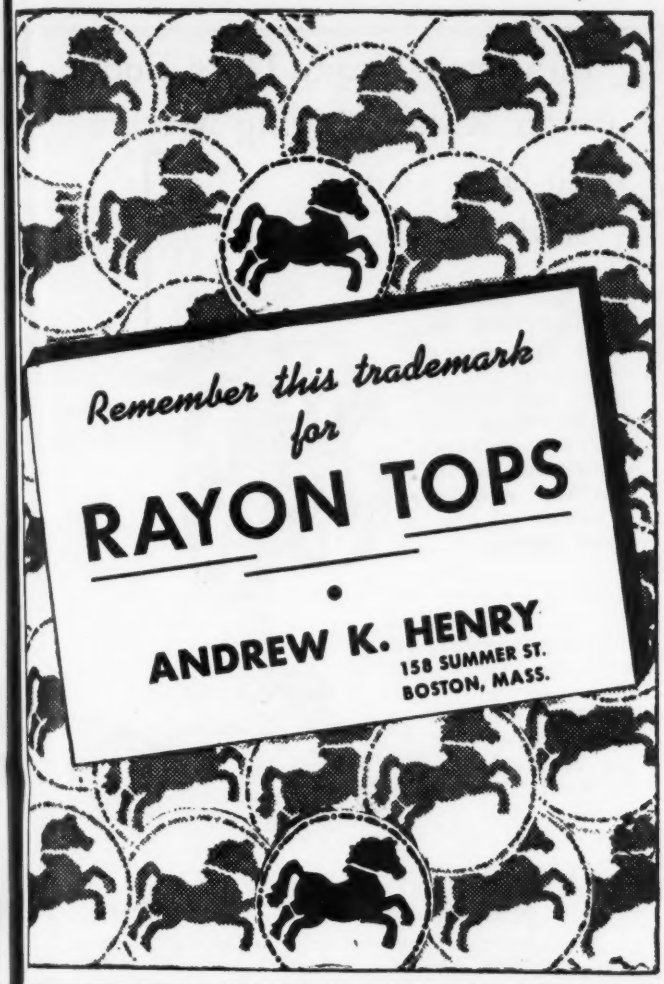

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COTTON WEEK MAY 17TO22

NATIONAL COTTON COUNCIL
COTTON-TEXTILE INSTITUTE

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KNITTING MACHINES

**meet the need for Speed—
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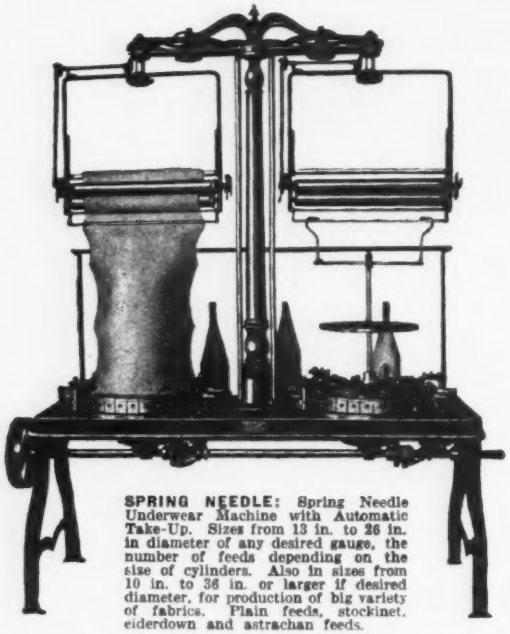

SPRING NEEDLE: Spring Needle Underwear Machine with Automatic Take-Up. Sizes from 13 in. to 26 in. in diameter of any desired gauge, the number of feeds depending on the size of cylinders. Also in sizes from 10 in. to 36 in. or larger if desired diameter, for production of big variety of fabrics. Plain feeds, stockinet, eiderdown and astrachan feeds.

CRANE Knitting Machines meet the demands of rapidly changing patterns and styles. Their middle name is *versatility* . . . plus smooth, fast running operation that eliminates expensive stops. Among their exclusive features are patented hardened Wing Burr Wheels and patented Thread Stop Motion. There's many a Knitting Mill in which batteries of Cranes are the mainstay of production.

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CRANE Improved Automatic
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Improved Automatic 3 Colored Plain Stripes. Made in sizes from 7⅜ in. to 20⅜ in. inclusive, of any desired gauge. Measurements are back to back of cylinder needles. Knit fabrics for bathing suits, theatricals, athletic goods. Crawford stop motion applied when requested.

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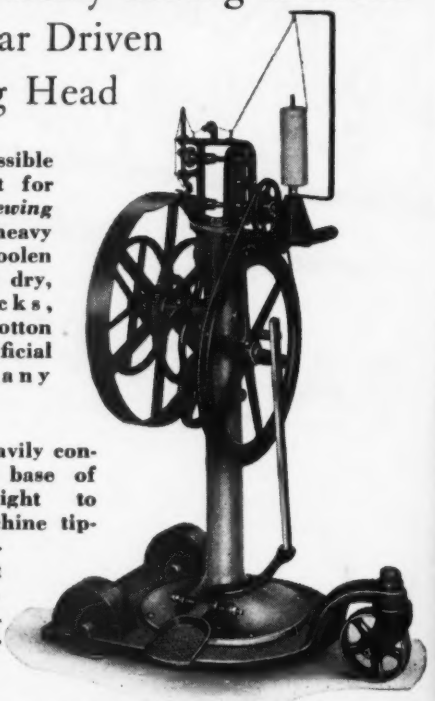

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Machine is heavily constructed with base of sufficient weight to avoid the machine tipping, also machine cut gears throughout and rubber tired floor wheels.

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No. 5

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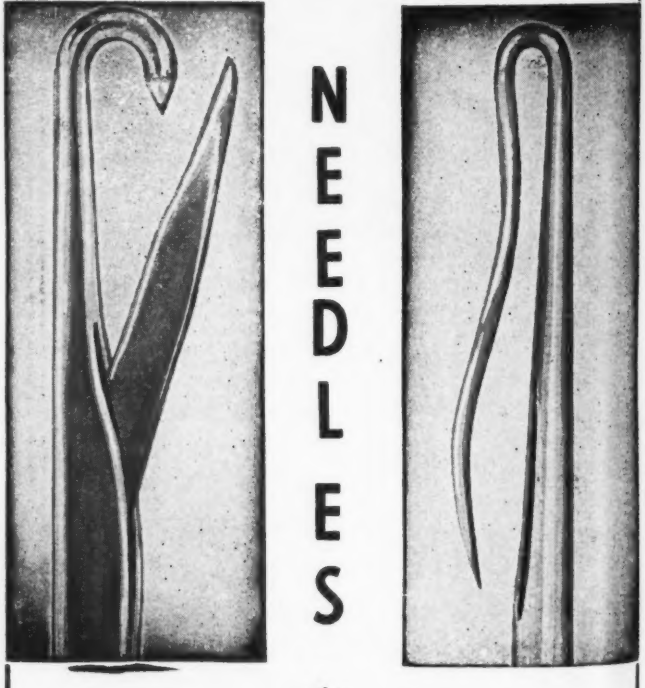

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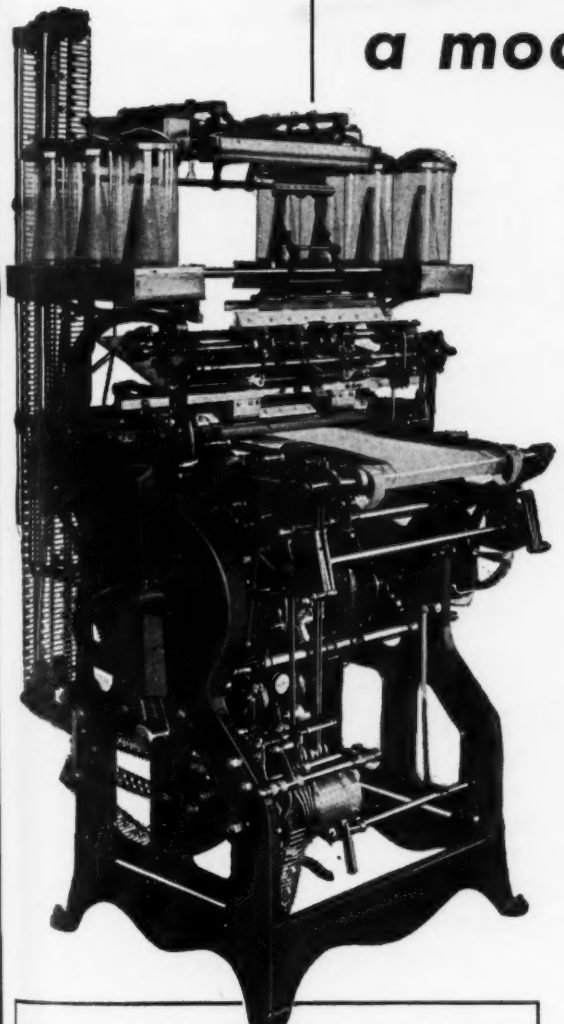
SAVING MAN POWER

WILDMAN

a modern machine at its BATTLE STATIONS



The fight against lost time and unnecessary work on the production line is a vital part of the war effort. At its battle stations in progressive mills throughout the land

THE WILDMAN

Single-Head, Single-Unit, Full-Fashioned

HOSIERY MACHINE

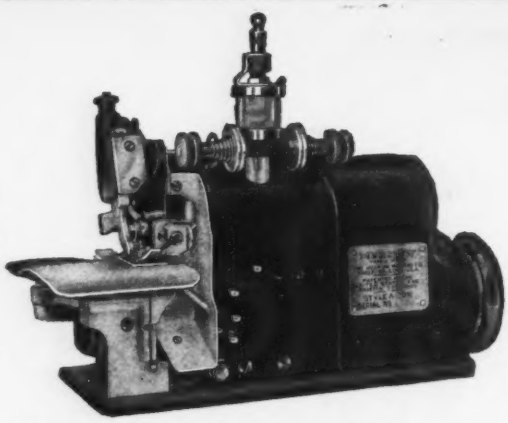
is knitting perfect stockings from top to toe in ONE OPERATION. It thus saves all the time ordinarily lost in the change-over to leggers and footers, plus thousands of precious man-hours wasted by this process every day.

★ ★ ★

Because of war work our production is restricted to supplying repair parts.

For AMERICA
"Throw YOUR SCRAP into the Fight"
AMERICAN INDUSTRIES SALVAGE PROGRAM

WILDMAN
MFG. CO., NORRISTOWN, PA.



Merrow Class A Machines, illlustrated, have made possible quality production, high speed and low operating costs to a degree greater than ever before. They are easy to handle, simple to adjust, sturdy in design, accurate in workmanship and readily adapted to many kinds of work. Let us or our distributor nearest you demonstrate the work of these machines on samples of your own fabric.

MERROW HIGH SPEED

OVEREDGING, OVERSEAMING AND HEMMING MACHINES

Produce Federal Specification Stitch
Types 501, 502, 503, 504 and 505

WAR WORK DEMANDS

Quality Results—High Production
Convenient Handling
Minimum Time-Out for Adjustment
or Repair—Low Upkeep Costs

Obtain Maximum Quality Production by Using a Machine Suitably Arranged for Your Work—Our Distributors or Our Direct Representatives Are on Call to Advise You Suitable Machine Arrangements for Various War Work and Proper Care and Operation of Machine.

ESTABLISHED 1838 — INCORPORATED 1894

THE MERROW MACHINE COMPANY

STARTING ITS SECOND CENTURY

2803 LAUREL STREET — **HARTFORD, CONN., U. S. A.**

Acme Products

for seamless hosiery knitting

Speak for themselves

Up-To-Date Machines

Needles

Economy Makers

ACME KNITTING MACHINE & NEEDLE CO.

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TOMPKINS

CIRCULAR SPRING NEEDLE

KNITTING MACHINES

FOR PRODUCING

UNDERWEAR	OVERCOATS
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FOR PRODUCING

TOQUES	SCARFS
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SINCE 1846 — SYRACUSE, N. Y.

STANDARD SILICATES

KIER BOILING

For better whites and level results, use a pound of STANDARD Grade 40 Silicate with each 3 to 5 lbs. of caustic in your kier boiling formula. Troublesome stains are eliminated and scarce chlorine is saved.

Ask the STANDARD service staff about grey sour-silicate kier boiling procedure for better whites with less bleach.

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ALKALI COMPANY
STANDARD SILICATE DIVISION
GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA
Plants at CINCINNATI · JERSEY CITY · LOCKPORT, N. Y.
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COP-BUTT-BOBBIN
WINDERS

Keep your machines at top production with Maintenance and Repair Parts from our stock.

Because Genuine Lazenby Parts are manufactured according to specifications and design drawings, correct fit and satisfactory operation are assured.

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THE LOYAL T. **IVES** COMPANY
EST. 1874

SPRING BEARD KNITTING NEEDLES

For Circular, Full Fashioned, Tricot and Milanese Knitting Frames, also Narrowing, Stand, Transfer Points and Welt Hooks for Full Fashioned Machines: Slides, Sinkers, Jacks, Guides or Flat Eyes, Sley and Milanese Points, Transfer Points or Quills, etc.

Sheet Metal Specialties to Order

NEW BRUNSWICK NEW JERSEY

"AS MODERN AS TOMORROW"

Styles, fibres, fabrics—*all* are constantly changing . . . And, with each change comes a new responsibility for the manufacturer of textile processing materials.

To meet these manifold changes, the manufacturer *must* not only have the facilities and equipment for constant research and production – but he must everlastingly keep in touch with the requirements of the Consumer, the Buying Trade and the Textile Industries.

Yes, Scholler Products are *"as modern as tomorrow"*, because they're the result of yesterday and today.

Dura Beau FINISHES
Reg. U. S. A. and Canada

SCHOLLER BROS., INC.
Manufacturers of Textile Soaps, Softeners, Oils, Finishes
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For Better Bleaching

Star Silicate enjoys greater popularity as a stabilizer and neutralizing agent in the peroxide bath because it produces whiter whites. In either batch or continuous process, *Star* can help you to get more and better bleaching per pound of peroxide. Check these *Star* qualities and advantages in your plant:

- ★ High purity of *Star* insures controlled oxygen release.
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- ★ Provides proper pH to protect delicate fibers.
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- ★ Every shipment of the same uniform quality for dependable performance.

Order a trial drum now, and let your peroxide do better work.

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THE STANDARD DE-SIZING AGENT

for cottons, rayons and mixed goods

For your de-sizing problems— our technical men are at your service . . . Write or 'phone.

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WRITE US FOR SAMPLES AND QUOTATIONS

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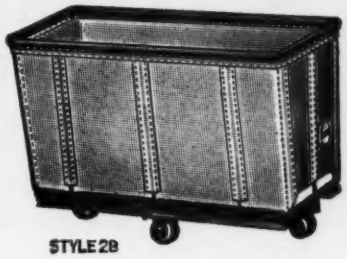
TENTERING and DRYING MACHINERY



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ROVING TRUCK

LANE
CANVAS
TRUCKS

For the well equipped mill

W. T. LANE & BROS., Inc.
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CORN STARCHES, DEXTRINES, GUMS, CORN SUGARS & SYRUPS

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John:
Douglas Crown Thin Boiling Starch is made in all fluidity ranges to suit each individual mill's requirements. Let's arrange for a trial order of the type recommended for our purposes.
Jim

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PROCESSING AND FINISHING PRODUCTS

Time is all important these War days. Products that will give better things and more of them—faster, are helping win this War. Onyx Processing and Finishing Products are Time Savers. They are setting new records in the mills and finishing plants of the Nation.

Onyx Processing and Finishing Products for all available fibers cover a range wide enough to meet conditions governing raw materials, production and war time restrictions. To textile manufacturers confronted with war time finishing problems, Onyx Research is available for consultation and real, practical help. They have helped others—they can help you.

Buy War Bonds and Stamps—
Every day.

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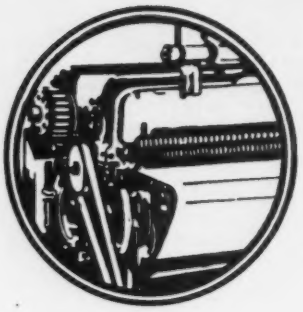
WEAVE FOR VICTORY



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"The Weaver's Friend"

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- Always Uniform
- Dependable
- Carries Weight Into the Fabric
- Penetrates Thoroughly
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MINEROL

The OUTSTANDING Conditioner for Textile Fibres

- Helps separate long fibres from short
- Prevents waste by saving *good fibres*
- Makes fibres more supple, pliable
- Provides control of conditions caused by static electricity
- Protects cards and preserves the wire
- Safeguards health, insures better working conditions by preventing Dust and Fly

SERVING THE TEXTILE INDUSTRY FOR 68 YEARS. ORIGINATORS OF THE BRETON MINEROL PROCESS FOR CONDITIONING FIBRE.

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ELIZABETH • NEW JERSEY

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BETTER THAN SOAP FOR FULLING

Eliminates soap boiling, stuck places, creases and whiplashes. Quickly saponifies oil, grease and dirt. Prevents congealing when used with soap, even if latter is stone cold.

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Since 1840

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A century of experience building standard and special machinery and rolls is at your service. What is your problem?

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66 Mill Street — Orange, Mass., U.S.A.

WE'VE LEARNED A LOT IN OUR 50 YEARS!

50 years of specialized experience in producing tanks and tubs for the textile industry *has taught us some things that will be valuable to you!*

Let us tell you about our complete Caldwell service, which includes Stainless Steel-lined tanks and tubs—round, rectangular and special shapes. *Catalog on request.*

W. E. CALDWELL CO.
Incorporated
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Caldwell TANKS AND TOWERS

Dependable Chemicals SPEED PRODUCTION

With more and more output demanded of the textile industry for Armed Services and Lend-Lease, with manpower supply ebbing, the importance of quality in the chemicals you use becomes a vital factor. As an example of quality, consider

HOOKER CAUSTIC SODA

Long known to many of the leading textile producers and converters, HOOKER Caustic Soda has established an enviable reputation for purity and uniformity. Although one of the busiest chemicals known to industry—contributing to the production of aviation gasoline, synthetic rubber, rayon, paper, and metal products—the quality of the HOOKER brand has been maintained in spite of tremendously increased demand. You can rely on HOOKER Caustic Soda and other chemicals for the textile industry, among them Liquid Chlorine, Lauryl Pyridinium Chloride and Sulfuryl Chloride.

HOOKER ELECTROCHEMICAL COMPANY
Niagara Falls, N. Y.
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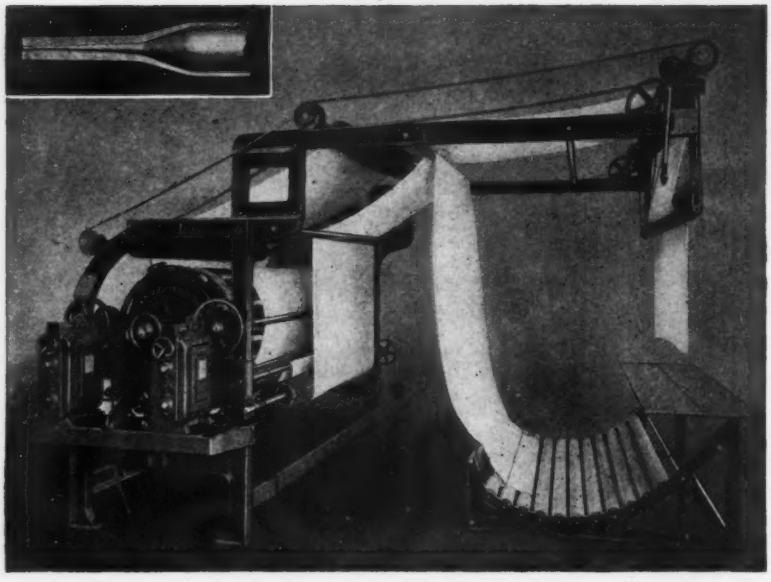
ARMY E NAVY
HOOKER ELECTROCHEMICAL COMPANY

HOOKER CHEMICALS

3681

Army and Navy Blankets call for a GESSNER NAPPER



Gessner's new and improved Napper will help you to fill all of the requirements demanded in specifications for Army and Navy blankets. The extent of control, evenness of nap and ease of operation are greatly appreciated features in woolen mills, and also for the finishing of spun rayons and knitted napped rayons. WPB regulations on purchase are strict, as they should be, but not prohibitive. Your inquiry will receive immediate attention.

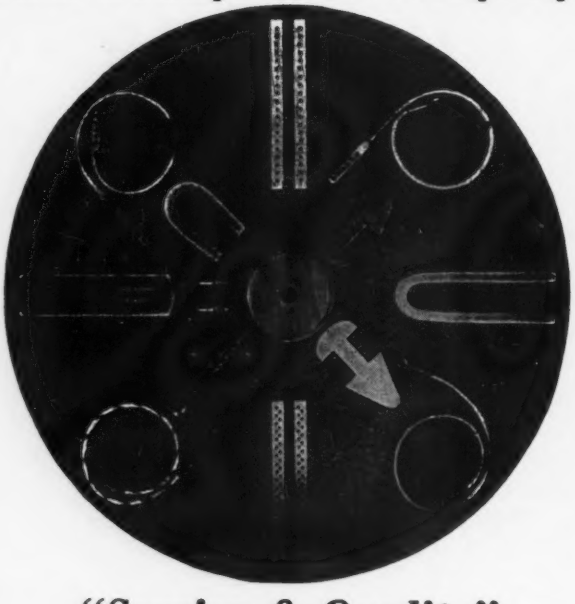
IMPROVED CLOTH FINISHING MACHINERY

VACUUM EXTRACTORS, GIGS, SCUTCHING MACHINES, SPOT PROOFING MACHINES, BRUSHES, PRESSES, DECATING MACHINES, DECATING APRONS, NAPPERS.

DAVID GESSNER CO.

WORCESTER, MASS.

Rice Dobby Chain Company



"Service & Quality"

MILLBURY-MASSACHUSETTS

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Samples on request

Southern Representative
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P.O. Drawer 1055, Greenville, S. C.

APPROVED **DANDUX** BASKETS MADE BETTER LAST LONGER

WHY are Dandux baskets used by state and government institutions which buy to rigid quality standards on a competitive price basis? More wear-per-dollar is the answer. The same factors make Dandux the leader in the textile field, too. If *you* want the maximum in quality in baskets, hampers and trucks, at the lowest long-term cost, outline your needs to us today. We'll rush prices and specifications at once.

DANDUX QUALITY CANVAS

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Manufacturers of Everything of Canvas

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Lengthen the life of your present belts with

Ensign 371 BELT PRESERVER

CLEANS PROTECTS PRESERVES *All Kinds of* BELTS

• You can add years to the life of your present belts—get more power—increase production by treating them with Ensign 371 Belt Preserver.

It cleans and preserves leather, canvas and porous belts, also establishes clean, resilient surface to rubber, composition and all non porous belts, preventing picking, oxidizing or cracking. Resists acid and alkali fumes.

Write for full particulars and for information on our 30 day test. It's a guarantee with no strings attached.

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Other Ensign Products available for maintenance and production problems.

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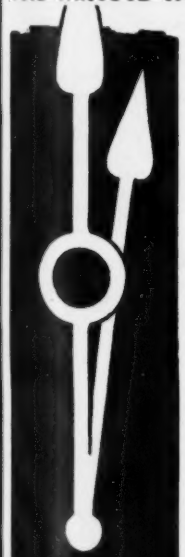
ONE MINUTE TALKS ON



Easier Way to Clean Humidifying Systems

When your humidifying system becomes clogged with slime, lint, dirt and grease, you won't have any trouble getting it THOROUGHLY CLEAN if you try the EASY, TIME-SAVING Oakite method specially developed for this work.

Just circulate the recommended Oakite solution through system as directed, then rinse. Method completely removes all deposits from spray heads and piping . . . quickly restores their normal efficiency . . . eliminates expense and delay resulting from "overflows" or "floods". NEW Digest describes time-tested ways to expedite all your mill maintenance work. Write for it TODAY!

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42 Thames Street, New York, N. Y.
Technical Service Representatives Located in All Principal Cities of the United States and Canada

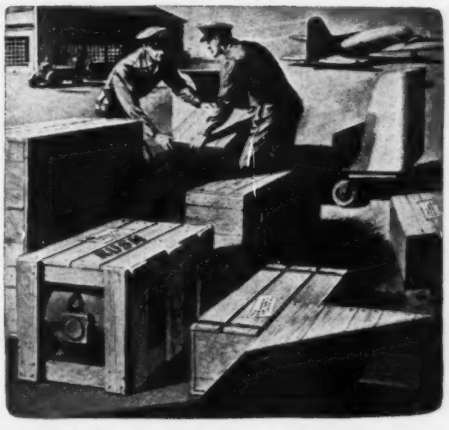
OAKITE *Specialized* **CLEANING**
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

This motor got on the job

A.M. PICK-UP

"Rush new motor Air Express" was the order a supplier received at 9 A.M. Ready for pickup at 10, it was taken to the airport, flown hundreds of miles to destination . . . and installed on a vital war job that same afternoon.

This motor was delayed



P.M. PICK-UP

Shipments ready for morning pickup but held for "late afternoon" routine, may be subject to delay. Heavy, peak-hour traffic may keep them grounded until a midnight or early morning plane.

For FASTEST delivery—Air Express!

To move emergency parts and critical material at 3-mile-a-minute speed, Air Express is on the job around the clock—not only on the home front, but working hand in hand with Army and Navy Air Transport services to supply our fighting fronts throughout the world.

You can help us give you the most efficient service in two important ways: SHIP EARLY—as soon as shipment is ready—to assure *fastest* delivery. PACK COMPACTLY—to conserve valuable space. Get our handy "Shipping Estimator" for finding costs and transit time. Write Dept. PR, Railway Express Agency, 230 Park Ave., New York City.

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Gets there FIRST

Phone RAILWAY EXPRESS AGENCY, AIR EXPRESS DIVISION
Representing the AIRLINES of the United States

SPECIALLY DESIGNED *Speed Sweep* FOR TEXTILE MILLS

Eliminates All Waste Motion; Outlasts Ordinary Brooms 3 to 1

THIS Speed Sweep brush fits right into accelerated wartime production. It is really two exceptional sweeping tools in one. A slight twist of the handle makes it a perfect brush. Another twist makes it a perfect broom. As a broom it handles corners, obstructions, and cramped spaces with ease. As a brush it takes care of open floor spaces.

Both as a brush as well as a broom this Speed Sweep is unsurpassed in handling lint and other litter. Two center rows of tufts are of heavy Bassine fibre to handle rough dirt. Outside rows are of finer Union fibre to control dust and fine particles. These tufts are closely spaced, compact and trimmed flat for "spring and snap" action. They are hand-drawn (not just stapled) into a narrow block so that they cannot come out or come loose. The block itself is of light weight wood, re-enforced by a pressed steel back. The handle is adjustable to the height of the sweeper and can be reversed instantly.

Speed Sweep brushes have been proved by so many firms and under such varied conditions that they are sold with an unconditional guarantee to meet your requirements. You receive full credit if you return brushes within 10 days.

One simple twist of the handle makes it a perfect brush.

Another twist of the handle makes it a perfect broom.

ORDER AS FOLLOWS:

CATALOG NO.	PRICES			
	6	24	96	Gross
No. 419 Speed Sweep *11" Block — 5¾" Tufts*	$2.00	$1.75	$1.45	$1.20

Smallest shipping unit, six brushes. Prices are F. O. B. Milwaukee. Textile producers and processors are entitled to AA-2X (P-139) priority rating. This rating insures prompt delivery. Order Today.

MILWAUKEE DUSTLESS BRUSH CO.
525 N. 22nd ST. MILWAUKEE, WIS.

FOR EXPENSIVE EQUIPMENT

Clean liquids never clogged a pipe line, or caused delicate control and valve mechanisms to slow up.

SARCO STRAINER

Put a Sarco strainer in your lines ahead of every trap, valve, pump, burner or lubricator. This insurance costs nothing once installed.

Sizes range from ¼" up to 8" for all commercial pressures with screens for steam, water, oil, brine, ammonia and other fluids.

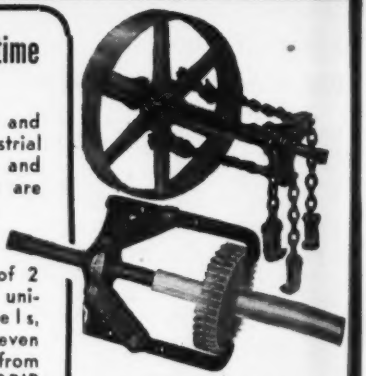
Order an assortment and put them in the line at the points where dirt, scale or other impurities cause shutdowns. They cost little, are easy to install and cleaned in a jiffy by blowing through. Ask for Catalog No. 1200.

SARCO SAVES STEAM

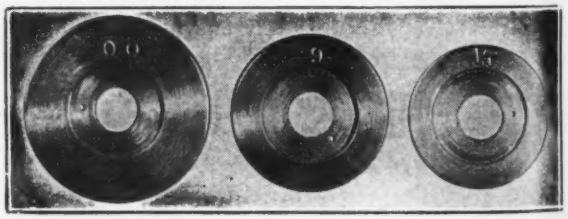
SARCO COMPANY, INC.
475 Fifth Avenue, New York, N. Y.
Sarco Canada Ltd., Federal Bldg., Toronto, Ont.

Essential tools in wartime —speed repairs

Wherever machines run and wheels turn — in industrial plants, service industries and on farms — wheel pullers are essential for efficient maintenance and repair work. ARMSTRONG-BRAY wheel pullers are of 2 types: (1) CHAINGRIP universal pullers—pull wheels, pulleys, gears and pinions even at considerable distance from end of shaft; (2) STEELGRIP rigid arm pullers (11 sizes, 2 or 3 arm models).



ARMSTRONG-BRAY & CO.
"The Belt Lacing People"
5340 Northwest Highway
Chicago, U.S.A.



Wayne Traverse Wheels for use on your Universal No. 90 winders, made of **oil hardened tool steel** or of bone hard fibre, cannot be beat for service and quality in their respective fields.

Our hardened steel wheels will last indefinitely, and because of their hardness will not cut or become nicked and therefore damage your silk. These wheels are accurately made. The size is correct and the finish of the face of the wheel is as smooth as polishing can make it.

If you want a softer and less expensive wheel we offer you our hard fibre wheels. These wheels are made of bone hard fibre, and are manufactured with the same accuracy and care as our steel wheels. These fibre wheels will give you the maximum of results that you can expect of a soft wheel. If, for any reason, you feel that you would like to try out fibre wheels, let us know and we will send you a sample of the size you want.

WAYNE MFG. CO. **Honesdale, Pa.**

SEARCHLIGHT SECTION

POSITIONS VACANT

MILL SUPERVISOR for Southern rayon weaving plant. One capable to take full charge of warping, slashing, twisting, quilling, fixing and weaving. State age (must be exempt from draft), previous experience and references. P-562, Textile World, 520 N. Michigan Ave., Chicago, Ill.

WANTED: a competent throwster with experience in novelty yarns. Give full details and references. Position in Virginia. If working in a defense plant, do not apply. Send application to P-563, Textile World, 330 W. 42nd St., New York, N. Y.

MANAGER of cloth department. Must be expert in winding spring and latch needle knitting of fabrics for overcoating, fulling, finishing and inspecting. P-564, Textile World, 330 W. 42nd St., New York, N. Y.

FOREMAN DYER experienced on Vats, Developed and Direct colors, on skeins, warps and packages, Cotton Yarn only. P-565, Textile World, 330 W. 42nd St., New York, N. Y.

POSITIONS WANTED

FOREMAN OR SUPERINTENDENT of Tricot or Milanese machines desires connection with reliable firm. 15 years experience on dress, glove and underwear fabrics. PW-545, Textile World, 330 W. 42nd St., New York, N. Y.

SUPERINTENDENT Rayons Draper. 47 years of age. Scotch Irish descent. A practical mill man who thoroughly understands any department. Expert loom man. Former Wraper road foreman who came up the hard way. Can make your mill produce. Can teach your loomfixers to turn out maximum production at low overhead per loom. Might consider overseer of weaving position. Understand all classes and weaves of fabrics, rayon, nylon, cottons etc. Will go anywhere. PW-551, Textile World, 330 West 42nd St., New York, N. Y.

POSITION WANTED: Warping and Winding foreman in rayon and silk also supervisor on slashing. First class references. American citizen. Prefer New England or Pennsylvania or New York state. PW-566, Textile World, 330 W. 42nd St., New York, N. Y.

ADMINISTRATIVE or TECHNICAL EXECUTIVE

Broad textile experience: practical, modern, mill organization;
personnel, purchasing, technical and production control;
equipment, process and product development;
experience on flat and pile fabrics for decorative, military and civilian apparel use;
native U. S. citizen, over draft age.
Qualified for industrial department of financial, management, consulting or operating firm.
Desires upper-level permanent connection.

PW-556, Textile World
330 W. 42nd St., New York City

WANTED
NIGHT SUPERINTENDENT

Production man capable of development as superintendent on one of night shifts. Must be capable organizer and be able to train help and see that machinery is kept in order. Familiarity with Draper looms and ring twisters essential and some dyeing experience desirable. Advise draft classification and previous employment. Certificate of availability from U. S. E. S. required before employment.

P-561, Textile World
520 No. Michigan Ave., Chicago, Ill.

TEXTILE CHEMIST WANTED

Rayon yarn producer has opening for a Textile chemist, preferably one with experience with sizing. Permanent position with good opportunities. State education, experience, age and salary expected. All replies will be treated as confidential.

P-571, Textile World
330 W. 42 St., New York City

POSITIONS WANTED

PLANT ENGINEER: twenty years experience in charge of machine shop, power and maintenance. Am employed but wish to make a change in the next two or three months. PW-567, Textile World, 330 W. 42nd St., New York, N. Y.

EXECUTIVE—Man of wide experience in governmental regulations, taxation, corporate and labor problems. Desires executive position with industrial or commercial organization; age 39; married, 2 children; graduate Columbia College and Columbia Law School; New Jersey attorney; engaged in active practice 13 years. PW-568, Textile World, 330 W. 42nd St., New York, N. Y.

BOSS WEAVER on government or government and fancy woolens, best of references, married, 40 years old, American, available after two weeks notice. PW-569, Textile World, 330 W. 42nd St., New York, N. Y.

SEAMLESS HOSIERY FOREMAN—Fixer now employed in Cuba desires position in United States. 20 years experience as foreman or fixer on almost all types of circular machines. Excellent references. Native born American, 39 years old, married, 2 children. PW-570, Textile World, 330 W. 42nd St., New York, N. Y.

WANTED

TEXTILE & HOSIERY EXPORTERS seeking new profitable market (full development post-war) should communicate at once:—W. B. O'Rourke & Company, Textile Agents 32, Wicklow Street, Dublin, Erie.

WANTED

Representatives calling regularly at Textile Mills. We have a highly specialized line—no War baby, but War AND peace-time proposition. No machines, but material continuously used and replaced securing continuous flow of repeat orders.

Give full outlines with references, also outline of present connections.

RW-560, Textile World
330 West 42nd St., New York, N. Y.

Commission Weaving Wanted

For our looms we can do Woolens or Worsteds 71" reed space. 4x4 Box.

MERRIMAC MILLS CO.
METHUEN, MASSACHUSETTS

FOR SALE

2—James Hunter #10 Fullers motor drive.
1—James Hunter #20 Fullers belt drive.
1—James Hunter #10 Dry Mill, motor drive.
1—Broadbent 48" motor driven extracter.
3—60" Tape Condensers 144 ends.
1—P. & W. 5 Blade Centurial Shear with turner.
3—P. & W. 66" Double Shears.
1—C & M Tacking Machines.
1—72" Double Woolen Shear.
2—107" Double Woolen Shears.
400AA—8" Automatic Loom Bobbins.
2—Soco Lowell 60" Section Warpers.

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All types of Circular and Flat Knitting Machines, also Parts and Latch Needles. State your needs or send us a sample to match.

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Brownell Twister set up for twisting paper, 36 spindles 5"x8" spools, complete with motor and extra spools, ready to run.

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5 lock stitch

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34—Draper Automatic Bobbin Changing Dobby Looms, Modified "D", 20 Harness Single Index Dobby, 69½" Reed Space, Midget Feelers 4 Bank Sliding Bar Stop Motion, Stafford Thread Cutters, Friction Let-Off, Worm Take-Up, Single Filling Fork, Motor Driven by ½ H.P. G.E. 550 Volt Motor.

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30—Wildman's Range 10 inch 10 cut 8 feed to 23 inch 10 cut 12 feed.
200—Nye & Tredicks Range 10 inch 10 cut 8 feed to 23 inch 14 cut 12 feed.
1—Scott & Williams Tubular latch Needle Knitting machine 20" 16 Feed 14 Cut.
2—Copper Cuff Knitters 23 inch 6 Feed 14 Cut.
8—Scott & Williams latch needle tube knitters, Tables.

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1—Howard & Bullough Bale Breaker, 1926 model, 12' extended apron Automatic Feed Regulator, Motor drive.
1—Howard & Bullough 1926 Model Vertical Opener with Hopper Feeders and #7 Openers, Motor Driven.
1—Howard & Bullough four (4) Section (48" per section) Cleaning Trunk.
20—Howard & Bullough Spinning Frames, 3" Gauge, 228 Spindles each, 1⅞" #1 Flange Rings in Cast Iron Holders, Separators, Band Drive.

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4—Stokes & Smith, M. D. Knowlton, Wilson Paper Box Machines.
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1—54" King & Gerber Continuous Roll-Off Machine with Rubber Nip Rolls and Slat Conveyor.
1—King & Gerber 65" 3-Roll Finishing Calender.
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1—4' Stainless Steel Lined Dye Beck.
1—19' Dye Beck.
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1—30" Tolhurst Copper Basket Extractor.
1—48" Tollhurst Copper Basket Extractor.
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3—50" Monel Lined Dye Jiggs.
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1 38" Padder 2 Rubber Rolls
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- 3—Button Breakers, 2-6", 1-52"
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- 5—48" Windle Doubling, Boarding & Winding Machines
- 1—set of 23 Lincoln 23" diameter by 88" face Copper Dry Cans
- 1—Proctor 2-truck Yarn Dryer with Seven Trucks
- 1—500 lb. Bleaching & Dyeing Kier with circulating Pump
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- 1—28" Copper Basket belt driven Extractor
- 1—48" Tolhurst Copper Basket Belt Driven Extractor
- 1—60" Tolhurst Motor Driven Extractor
- 5—Elliot & Hall Power Folding Machines, 1-40", 4-46"
- 2—Inspecting & Winding Machines, 1-54", 1-64"
- 10—50" Draper Automatic Magazine Worsted Looms, 6 harness, with warp stopmotions, belt driven
- 11—82" Crompton & Knowles 4 x 4 Box Woolen Looms, 25 harness, friction drive
- 1—60" James Smith 2-cyl. Shoddy Card Set. Including Bramwell Feed
- 1—66" Roy Floor Type Card Grinder

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93,594—Triptod Bobbins — For Cap Spinning, 7"
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56—C&K 43" Looms 4x4 Box, Belt driven.
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1—Universal SKEIN to CONE WINDER 12 Spdle.

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2—ROPE WASHERS 8' and 10' BOXES.
2—OPEN WIDTH WASHING & SCOURING BOWLS with 4 sets of SQUEEZE ROLLS (66" working surface) with 8 MONEL METAL IDLER ROLLS in EACH BOX.
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1—RAILWAY SEWING MACHINE for 75" goods.
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1—CALENDER 5 Bowl 47" 3 cotton & husk rolls, 2 steam heated, with 3 roll Mycock Expander.

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1—88" P & S Fan Loop dryer
1—42" Tolhurst Belt Driver Extractor
1—Examining Table 60" variable speed drive
1—26 ft. 15" Dyeing reel with bearing
1—Open Washer 60" 2 Squeeze Rolls, 2 compart.
1—David Gessner Decatizer 72" wide
1—60" King & Gerber Tuber
1—50" Measuring Machine
3—Defoggers 220 Volt, 2 Phase motors
1—50" W V Button Breaker
1—Complete silk & rayon burnout machine with engraved rolls
2—56"—68" Batchers, 2 rolls
3—44" x 23" Copper Dry Cans

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3—50,000 to 100,000 Gal. Cap. Elevated Steel Water Tanks on Towers.
3—500 to 1000 GPM Fire Pumps.

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3 Price Smith 3½ x 6 Dandies; 2—8 Sp. Finishers 6 x 12.

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1½ or 2 Ton Textile Kier. Prefer Stainless Steel. Write Full Details of What You Have to Offer.

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1 Flax Tow Finisher Card by Combe Barbour equipped with Mackie automatic card feeder and drawing head.

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84" wide, 23" Diameter with 2 uprights and gears.

W-540, Textile World
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WANTED

Several Sets of Wide Cans

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Machinery to produce 600 pounds of fingering yarn per day.

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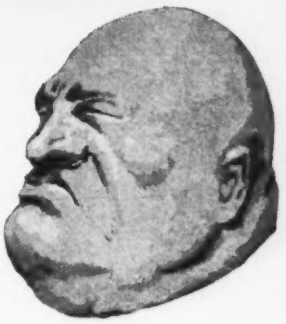

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PRINTING MACHINES

6—Rice, Barton & Fales 3 to 8 color Print Machines, 40" to 64" wide, with color pans, mandrels, star & furnisher gears, etc.

CALENDERS

2—V.V. B.V. Calenders, 50".
2—Morrison B.B. Calenders, 50" & 60".
1—Morrison 3-roll B.B. Calender, 64".
1—60" Embossing Calender.
1—V.V. 46" Calender.

PALMER QUETCHES

3—Morrison & V. V. 60" & 72" Palmer Quetch Units.

AGER

1—18' x 60" Ager.

KETTLES

6—Textile Copper Steam Jacketed Color Kettles, tilting type, agitated, 30 to 200 gallons capacity.

DRYERS

3—National Loop Dryers, 28', 33', 65' lg.
2—P & K Airlay Dryers.
2—V.V. 50" & 66", 5 & 7-Tier Dryer, fin heaters.
1—Phila. Dry. Mach. Co. Hurricane Continuous Skein Dryer.
4—Frank Bailey Truck Dryers with extra trucks for skein & tube yarns.

PRINT PADDER

1—3-Roll Print Padder, dry tower with unit heater.

DYE JIGS

1—Battery 4—Butterworth stainless steel lined dye Jiggs, 45".
3—Butterworth 60" stainless steel lined dye Jiggs.

CAN DRYERS

300—Dry Cans, 50" to 108" face, 23" to 84" dia.

SCOURING & DYEING MACHINES

1—Sargent 3-Bowl skein Scouring Machine.
10—K-W Skein Dye, Machines, 20 to 30 sticks, hoist type.
1—Obermaier 400# Vertical Package Yarn Dye. Machine, with wash-off kettle and two motor driven centrifugal pumps.

BUY BONDS
AND
SAVE TIME
TO
SAVE AMERICA

Remember—get your idle machines into War Production. Send us your list.

TENTER FRAMES

2—W & J. 50' Frames with Morrison stainless steel clips, 44" & 54" wide.
3—V. V. & W. & J. 60' & 60' Frames.

FULLING MILLS

6—Rodney-Hunt Fulling Mills, gear drive.

DOUBLERS

3—P & W. 46" & 66" doubling, reeling & Measuring machines.

FLAT FOLDERS

6—Elliot & Hall Flat Folders, 42" to 60" wide.

OPEN WASHERS

1—Continuous Full Width Washer, consistting of 10 sections, 4 nips each section, 66".
1—60" Continuous Boil-off Machine, steel tanks.

ROPE SOAPERS

2—Rodney Hunt 10' Rope Soapers.
1—V. V. Continuous square formation Washer.

SHEARS

3—Parks & Woolson double blade Shears, 66" with list saving device.
1—Parks & Woolson 3-blade Shear, 60½" with list saving device.

BLEACHING

8—Bleaching 4-5 ton Kiers, vomit type.
1—5-ton Kier, circulating type, pump and motor.
2—Lincoln 2-roll chemical squeeze rolls.
2—Arlington Rope Squeezers, with clutch pulley drive.

BEAMERS—BATCHERS

4—V. V. 50" & 55" Beamers.

DECATERS

2—David Gessner & Parks & Woolson 72" & 48" wide, complete with Nash Pumps.

DYE BECKS

29—Dye Becks, Morrison, V. V. and General, 3' to 8', stainless steel and wood boxes.

EXTRACTORS

3—V. V. 60" rubber lined & Copper Extractors.
1—50" copper basket Extractor, underdriven centrifugal machine.
10—Burkhardt, V. V. Fletcher, Tolhurst & Haring & Stephens, 48", copper baskets.
4—Tolhurst & V. V. 40" to 44" copper lined baskets.
1—King & Gerber 42" Extractor, copper basket, self balancing type.
10—Tolhurst, American Laundry, Adams & Troy copper lined Extractors, self balancing, 20", 26", 28", 32", 40".

WORSTED SPINNING FRAMES

25—Ring Spinning Frames, 160 spindles each, 3½" pitch, 8" traverse, 1¾" ring, 4" front roll.

BUTTON BREAKERS

2—Textile & V. V. Button Breakers, 60" & 72" brass rolls.

MERCERIZING RANGE

1—Complete Mercerizing Range.

PADDERS, MANGLES, QUETCHES

4—Textile 50" 2-Roll Dye Padders.
7—Butterworth 50" 2-Roll Starch mangles.
2—Textile 80" 2-Roll mangles.
8—Butterworth & Morrison 2 & 3-Roll Quetches, 50", 50" & 72" wide.

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1—Permutit Water Softener, 103" hg, 63" wd, cleanout 13" x 17".
2—10 x 10 vertical softeners, zeolite piping, valves, meters and fittings.
2—Pressure sand filters, 8' dia., by 20' long, complete with pipe connections, valves and fittings.

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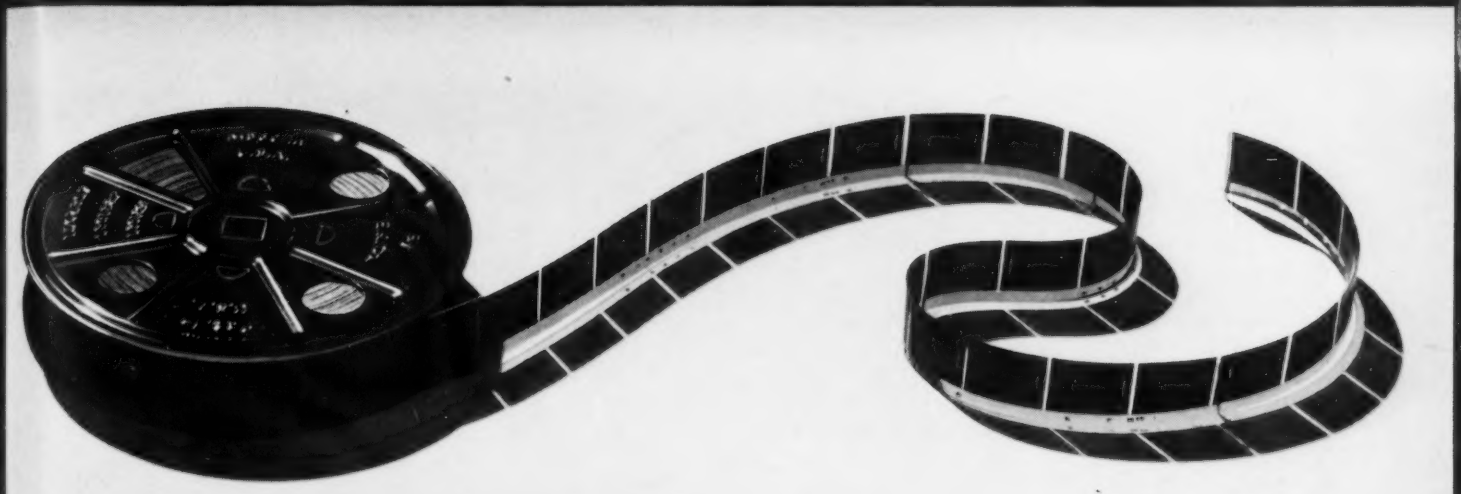

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